Chemical Week

September 14, 1957

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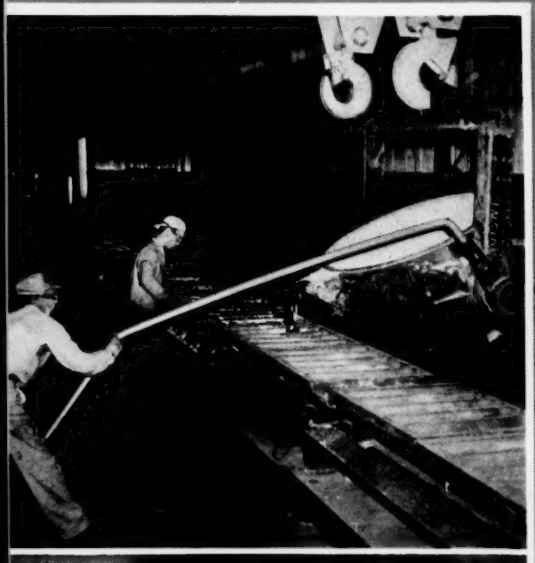

"Atomic Metals" production and sales will be pushed by new integrated company . . . . . p. 24

Nonferrous metallurgy steps ahead, as blast-furnace techniques are used on zinc . . p. 38

Hormone-containing cosmetic gets FDA approval as drug. It's a trend worth watching . . . . p. 67

U. S. ethylene glycol exports for first half of '57 already exceed shipments for all of '56 . . . p. 93

Du Pont's plastics salesmen: They promote product literature by stressing its completeness . p. 101

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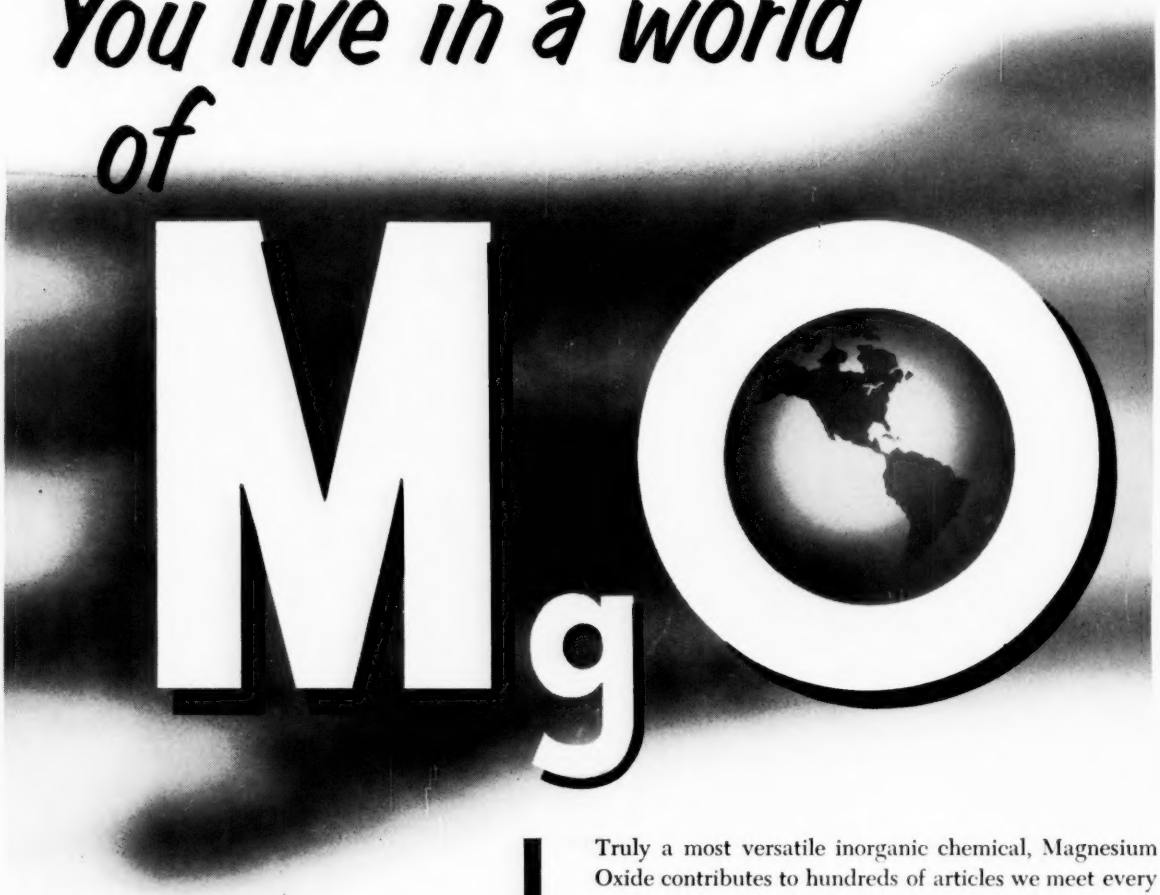

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It used to be that the vital stream of petroleum products frequently was interrupted by premature hose failures. Complaints were commonplace, users changed brands often and hose manufacturers could do little to improve the situation.

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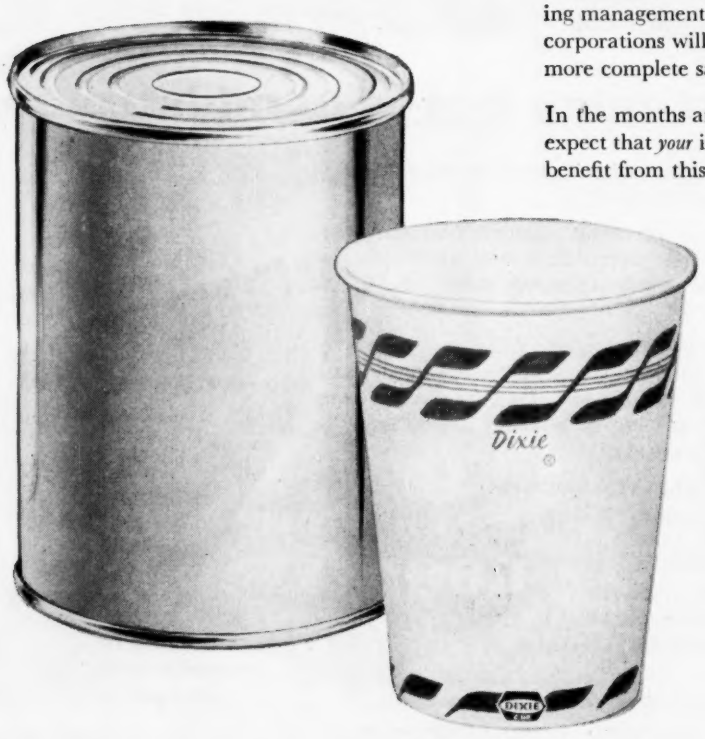
In the months and years to come, you can fully expect that *your* industry, and those it serves, will benefit from this merger!



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Chemical Week

TOP OF THE WEEK

September 14, 1957

▶**113-year-old Davies-Young finds healthy growth** in new products, new divisions. Here's how it got to be largest specialty soapmaker in the U.S. ..... **p. 29**

▶**India tries to limit chemical imports,** but extends welcome to capital investment ..... **p. 49**

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24 National Distillers reveals newest stage in its plans to consolidate position in "light metals" field.

25 U.S. shale oil reserves take big leap as new estimates come in.

Niagara power development looked ready to go, but snags may delay it.

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Fluoridation of drinking water supplies gets powerful support from U.N.

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New chemical complex in Hungary will aim for self-sufficiency.

Some companies are suffering from power cutbacks at Bonneville.

29 SPECIALTIES
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34 Water-soluble polyvinyl alcohol films, which haven't made the grade commercially so far, may soon find wider use.

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81 PRODUCTION
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Du Pont comes up with detailed engineering data book to help it sell its plastics.

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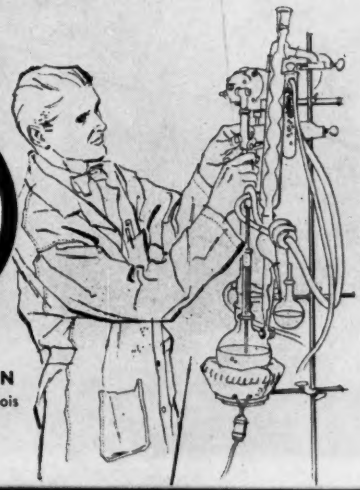

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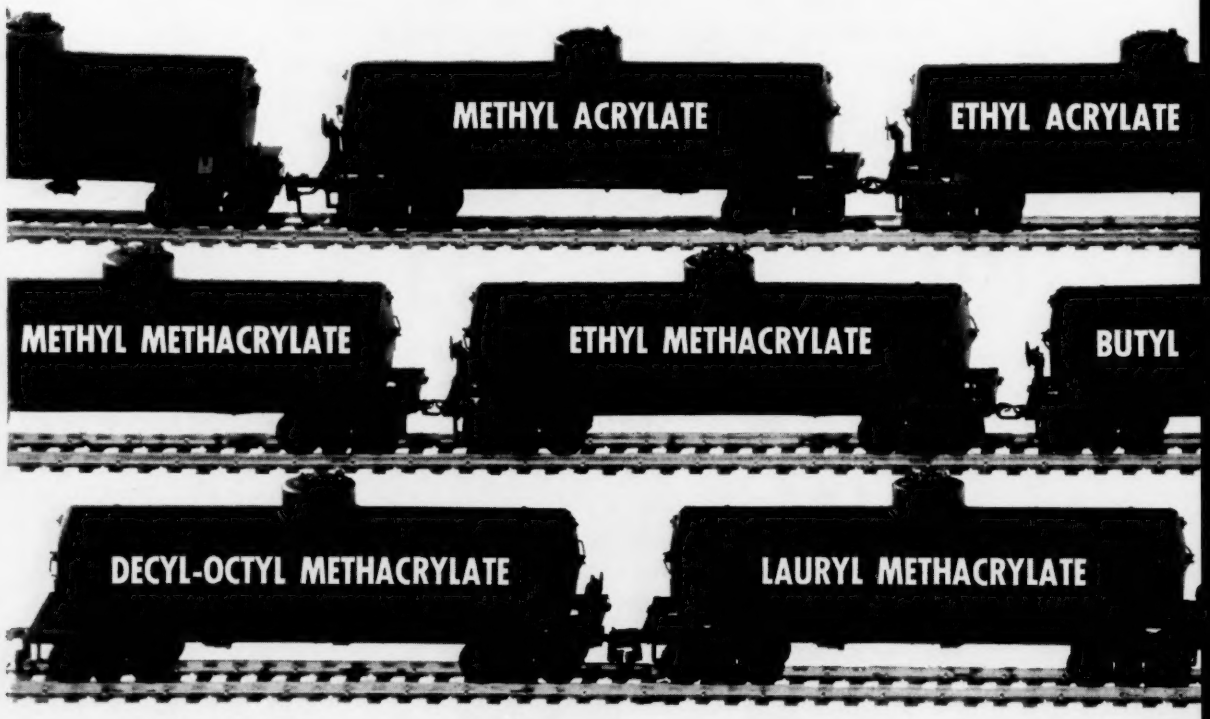
Take a look at the Rohm & Haas acrylic monomers listed below . . . the broadest range of acrylic raw materials available. Rohm & Haas can furnish you with not only a wide range of acrylics to develop new products, but also with information and services on handling them.

The proper acrylic monomer can impart to your polymers or copolymers one or more of these properties:

- **Better heat and light stability**
- **Internal plasticization**
- **Increased polymerization rate and copolymer yield**
- **Improved compatibility with other resins**
- **Stability of emulsions**
- **Better adhesion properties**
- **Solubility in alkalies, including ammonia**

Polymerization products of these acrylics can vary in properties from hard, tough solids to semi-liquids, depending upon the monomer used. In copolymerization, acrylic monomers can be used with vinyl chloride, vinyl acetate, vinylidene chloride, acrylonitrile, butadiene, styrene, and unsaturated polyesters. The utility of acrylics has already been proved in protective coatings, leather and textile finishes, sizing for nylon, adhesives, synthetic rubber, lubricating oil additives, and water-base paints for interior and exterior use.

For over half a century, the Rohm & Haas Company has maintained leadership in the acrylic field through its vigorous research, development, and production programs. As a result of this long experience, Rohm & Haas is able to offer sound advice on the safe and efficient handling of acrylic monomers. Rohm & Haas technical service on these monomers includes recommendations on transportation, unloading, storage, inhibitor removal, and the design of piping and storage vessels. For complete information about Rohm & Haas acrylic monomers and services, write to Department SP.



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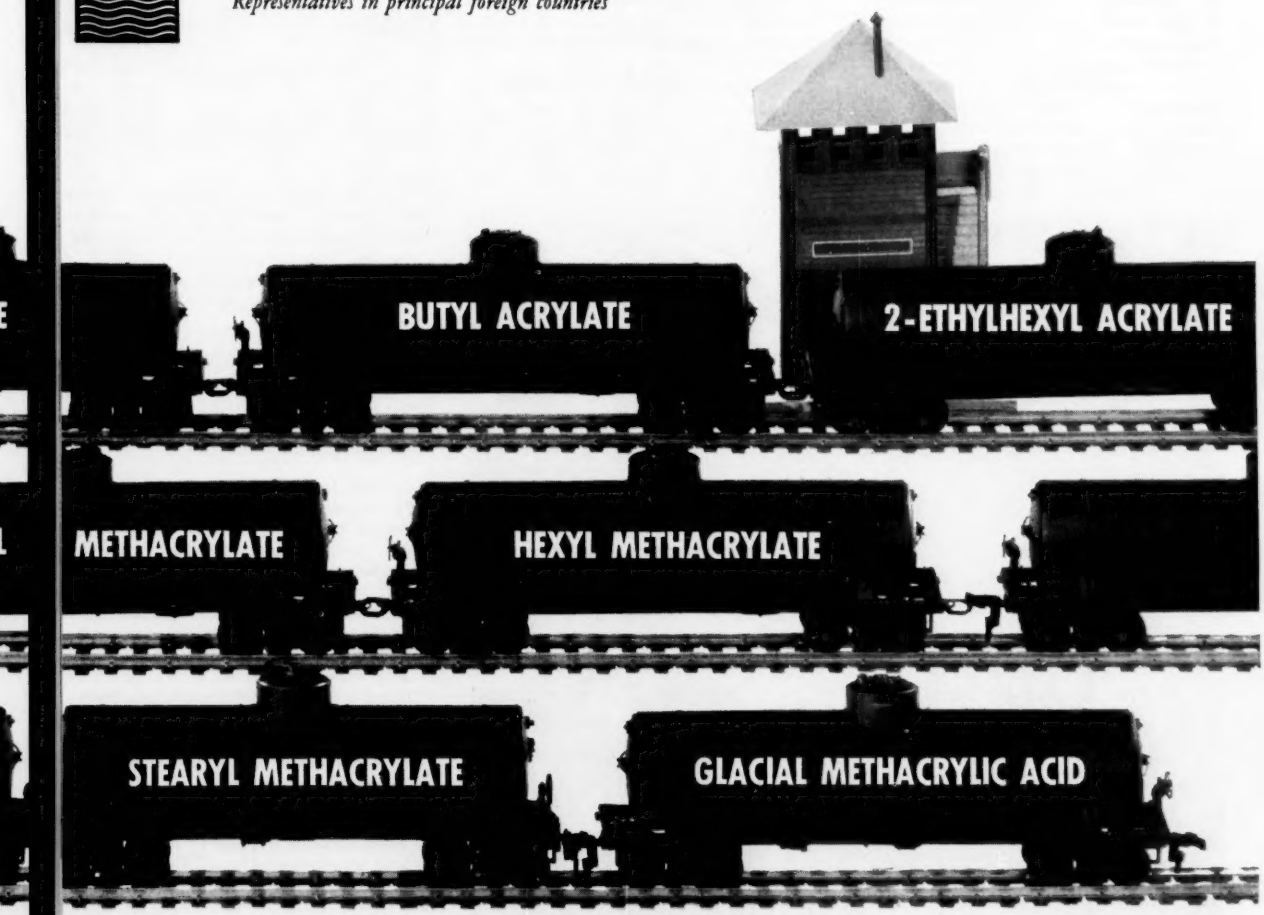

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Titan Superjectors—continuous-type centrifuges—operate as long as a month without shutdown for cleaning. ASK FOR BULLETIN 946.

Pfaudler

Pfaudler Corrosioneering News Published by The Pfaudler Co., Rochester, N.Y.

How Bristol Laboratories makes glassed steel work harder in new product development

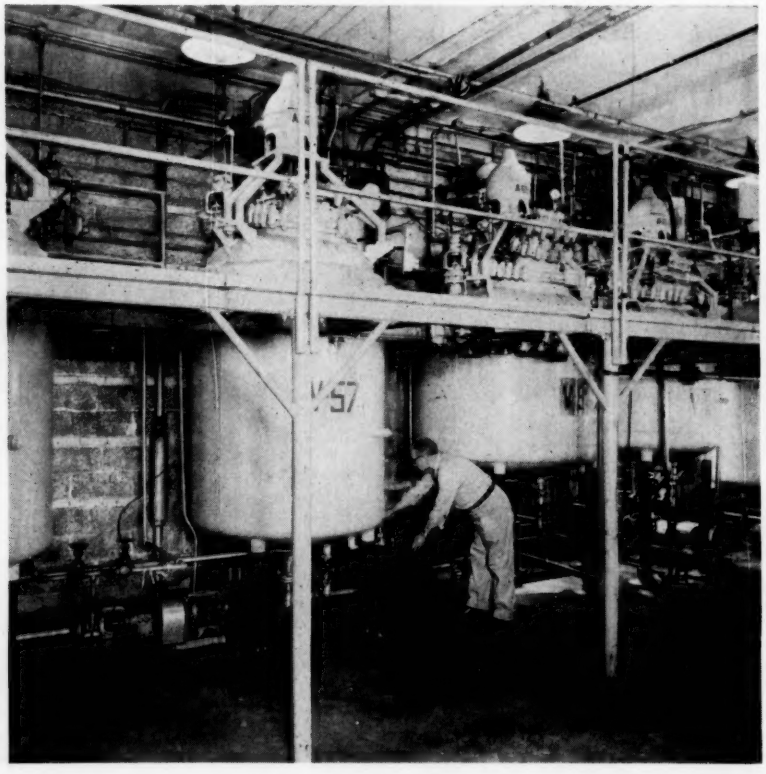
Any company faced with the combined problem of providing facilities that assure product purity while minimizing corrosion can profit from the experience of Bristol Laboratories, Syracuse, New York.

Research pilot plant procedures and quality control of production are all part of the routine of getting new products to market. Key link between research and production, of course, is the pilot plant. Long ago Bristol saw the necessity of having process equipment that is inert enough to permit handling most of the corrosives encountered, particularly HCl.

For example, the production of Polycycline, Bristol's trade name for tetracycline, involves several steps, including direct fermentation and acetylation. Corrosion is a serious problem in the latter step. It must be avoided or the product would become contaminated.

Pfaudler steam jacketed, glassed steel vessels solved this problem economically. Resistant to all acids, except HF, and all alkalies up to pH 12 at 212° F., it gave Bristol Labs better protection than any other material of construction. Because this glass is inert, there are no undesired side reactions. Adherence is no problem. This makes cleaning and maintenance easier and quicker. Changeover time is reduced to the minimum. Output is, therefore, greater.

These are some of the advantages you gain with Pfaudler glassed steel. It gives you the versatility you need in meeting today's highly competitive markets.



Glassed steel is tough, but...

It's not invincible. Simple common sense, care and attention account for the many, many pieces of glassed steel equipment that have provided 25 years and more of corrosion-free service.

Quick repairs to damaged areas also prolong the life of such equipment. These repairs are easy to make, require little special skill.

Preventive maintenance in installation and during operation is best, though.

Take knocks, for example. Soft sole shoes or heavy wool socks over shoes will save a glass lining from scratches during tank inspections. Securing tools to a belt helps too.

Take shocks. A simple, constant check of vessel and charge temperatures will protect linings from thermal shocks.

Take locks. There's a right way to draw up flange nuts. Once learned, you'll never have a cracked flange lining.

You can train all your men to understand and follow these and many other pointers by having them attend a Pfaudler Maintenance Seminar. This program is given at regular intervals at our own home plants and, when feasible, right in your own plant or locality.

The Pfaudler representative who contacts you can help.

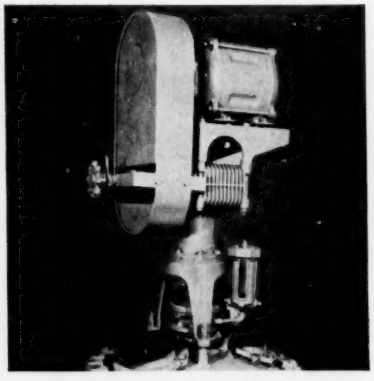
Still another source of information about the care and handling of glassed steel is to be found in our technical bulletins, such as No. 892—*The Surprising Structural Strength of Glass Fused to Steel.* A copy of this is yours if you'll simply mail us the coupon.

Corrosioneering News

Quick facts about services and equipment available to help you reduce corrosion and processing costs.

New, more compact drive... power is higher, agitation range wider

When you can increase the load carrying capacity of a drive without increasing its size, you get at least three extra advantages. You get a wider range of agitation speeds, a compact unit that leaves surrounding area more accessible, and you eliminate cumbersome supports.



This 2.5W Drive is equipped with stuffing box. Can also be used with rotary seal. Hydraulic drives of the new design are available for 100% explosion-proof construction and wide, variable speed range.

All this we have done with our new Type "W" Drives.

Carry greater loads. These new drives handle heavier loads than any other type of comparable worm gearing. They have what is called a "throated" design — both gear and worm teeth have convex arc shapes—which allows more teeth to mesh simultaneously.

More compact. Notice that the motor is mounted out of the way *above* the drive. This eliminates angular bracing from the top head, permitting a greater number of top head openings. These openings are more accessible and give great flexibility to top head layout . . . particularly valuable features on smaller reactors. (Side mounted motors are available where headroom is limited.)

Hydraulic, explosion-proof drives available. When you want 100% explosion-proof construction and wide variable-speed range, you can specify hydraulic drives. These can be supplied at the factory or substituted for existing drives in your plant, by converting with hydraulic motors.

The new drives can also be furnished with double reduction gearing and flange-mounted motor. This provides a totally enclosed gear drive with agitator speeds from 525 to 7.3 RPM in 27 increments.

Complete flexibility. You can use the new "W" Drives with stuffing box or mechanical seal on both glassed and stainless steel reactors.

Standard 2.5W, 3W, 4W, and 5W Drives are equipped with constant speed sheaves with static-free belts that can be combined to give any required speed for the agitation you desire.

Complete data on design and performance are in Bulletin 951. Check the coupon for a copy.

NEW SERVICE:

Customer advisory board reviews Pfaudler designs

The best way to give a customer what he wants is to ask him. Pfaudler did just that by inviting a representative group of management engineers from leading chemical processing plants to appraise design aspects of their standard equipment.

Particularly in the areas of plant hook-up, operation, and maintenance, the experience these men have derived from using our equipment complements nicely our design, manufacturing, and field service experience.

The first of the annual meetings of the board was held in May of this year and the commentary more than met our expectations. You will see tangible evidence of the Advisory Board's suggestions in our exhibit at the 26th Exposition of Chemical Industries (Dec. 2-6, New York City).

The Advisory Board is an extension of our continuing efforts to encourage intercommunication between our own personnel and customers. Pfaudler Corrosion Seminars and Maintenance Seminars are still other facets of this program.

We are, of course, always happy to receive your individual suggestions as to how we can serve you better.

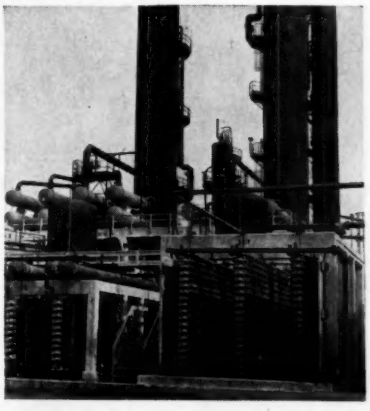
Glassed pipe, fittings, valves vital links in preventing corrosion

Getting materials to and from process equipment presents numerous areas of possible contamination and corrosion. This is why Pfaudler glassed pipe, fittings, and valves make worthwhile additions to your corrosion-free reactors, heat exchangers, columns, etc.

The glass in Pfaudler pipe, fittings, valves and accessory equipment is identical to that used on Pfaudler reactors and tanks—resistant to wide range of acid and alkali corrosion and economically justified.

The smooth surface of glass also minimizes friction, speeding up product movement. Cleaning is simplified.

Standard flanged glassed pipe and fittings are available in diameters from 1½" to 12" I.D. for temperatures up to 400° F. and 150 psi. Outlet, safety, diffuser and line valves will also handle a comparable range of temperatures and pressures.



Another way of using glassed pipe—jacketed and unjacketed—is in the form of heaters and coolers. Over 10,000 feet were used in making up these polymer heaters and coolers.

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Please send me information on ☐ Glassed Steel Reactors ☐ Bulletin 892—Structural Strength of Glassed Steel ☐ Bulletin 951—New "W" Drives ☐ Bulletin 886—Pipes, Fittings, Valves.

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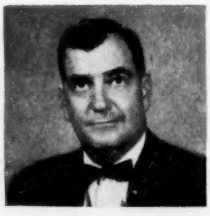

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OPINION

Detergent Forecast

TO THE EDITOR: . . . your CW Report, "Synthetic Detergents: The Boom Won't Wash Out" by Donald Price (*CW, Oct. 22, '55*) . . .

I have kept this copy of the report and found that all of Mr. Price's predictions have been confirmed by other current reference sources. . . .

R. E. BENSON
Magee Chemical Co.
Kansas City, Mo.

Unsolicited Ideas

TO THE EDITOR: Regarding the article "Ideas from Outsiders Can Be Dangerous" *(CW, Aug. 17, p. 107)*, there appears to be an ambiguity. In the first column, p. 113, you say, "Inventive property, to be secret, must be known to the idea man alone." However, in column two appears this statement: "The courts have called secret a process that actually had been patented but was not generally apparent to people in the field."

On p. 202 of "Patent Practice and Management" by Calvert appears a clear statement of the situation: "Newness to one receiving the idea seems to be held generally to be sufficient, even though the idea submitted may not be new to other members of the public. It is sufficient for recovery ordinarily if A has an idea, B does not have it and wants it from A, and B receives the idea from A and uses it."

There remains, however, an undiscussed phase of this problem of unsolicited ideas—that about 80% (on a dollar basis) of all business in the U.S.A. is done by private corporations. In 1790, there were no corporations. Corporations are creatures of the state and exist because of a statutory law. Corporations, like patents, do not have a constitutional right to existence. It is a mere legislative right, which can be revoked by the legislative will of the various states.

Thus, patents and corporations live at the sufferance of the people. Yet, it now appears that the people cannot freely submit their inventive ideas to their creation, the corporation. Not even a stockholder, as an owner in part of the corporation, can submit his idea to his own corporation, without prior approval from management, which management need not own any stock.

Moreover, it is a duty of all corporations to advance the general welfare, as is this a duty also of patents. In a competitive economy, it is the corporations' duty to use inventions in their field in order to produce a better product at a lower price. If the corporations refuse to improve their processes and manufactures for fear of being sued, then the laws of incorporation should be amended requiring corporations to use the inventions, which will produce the more abundant life.

FRANK MAKARA
Counsellor at Law
Registered Patent Attorney
New York

CW thanks Reader Makara for his comments on two distinct aspects of the problem of handling unsolicited ideas.

We feel the quoted statements from p. 113 are not conflicting, that the second quotation merely explains a special case of newness. The definition from Calvert is one of those very general statements that can be dangerous in the law. Thus CW pointed out that the requirement for newness is applied generally where a confidential relationship is involved, but may be waived if a contract has been made—particularly where both parties have had a chance to discuss the terms of the contract.

CW respects Reader Makara's contentions, though it cannot agree that corporations will not improve processes for fear of being sued and that people cannot freely submit their ideas to corporations. The article is concerned, however, with the methods by which a corporation can defend itself from those who would take advantage of the position in which corporations have been placed, in regards to unsolicited ideas, by law and by judicial interpretation.—ED.

CW welcomes expression of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

MEETINGS

Sixth World Congress on Chemical Fertilizers, Heidelberg, Germany, Sept. 10-15.

Chemical Market Research Assn., annual resort meeting; theme: impact of St. Lawrence Seaway on chemical industry; Lake Placid Club, Lake Placid, N.Y., Sept. 15-17.

Canadian Agricultural Chemicals Assn., 5th annual meeting; theme: safety and health; Mont Tremblant Lodge, Quebec, Sept. 15-18.

International Union of Leather Chemists Societies, 5th conference, Rome, Italy, Sept. 15-20.

National Industrial Conference Board, 5th marketing conference, Waldorf-Astoria Hotel, New York, Sept. 18-20.

National Bureau of Standards, free-radicals symposium, Washington, Sept. 18-20.

Drug, Chemical and Allied Trades Section of the New York Board of Trade, 67th annual meeting, Galen Hall, Wernersville, Pa., Sept. 19-21.

National Records Management Council, 4th annual conference, Hotel Roosevelt, New York, Sept. 20.

Technical Assn. of the Pulp and Paper Industry, engineering conference, Netherland Hilton Hotel, Cincinnati, Sept. 23-26.

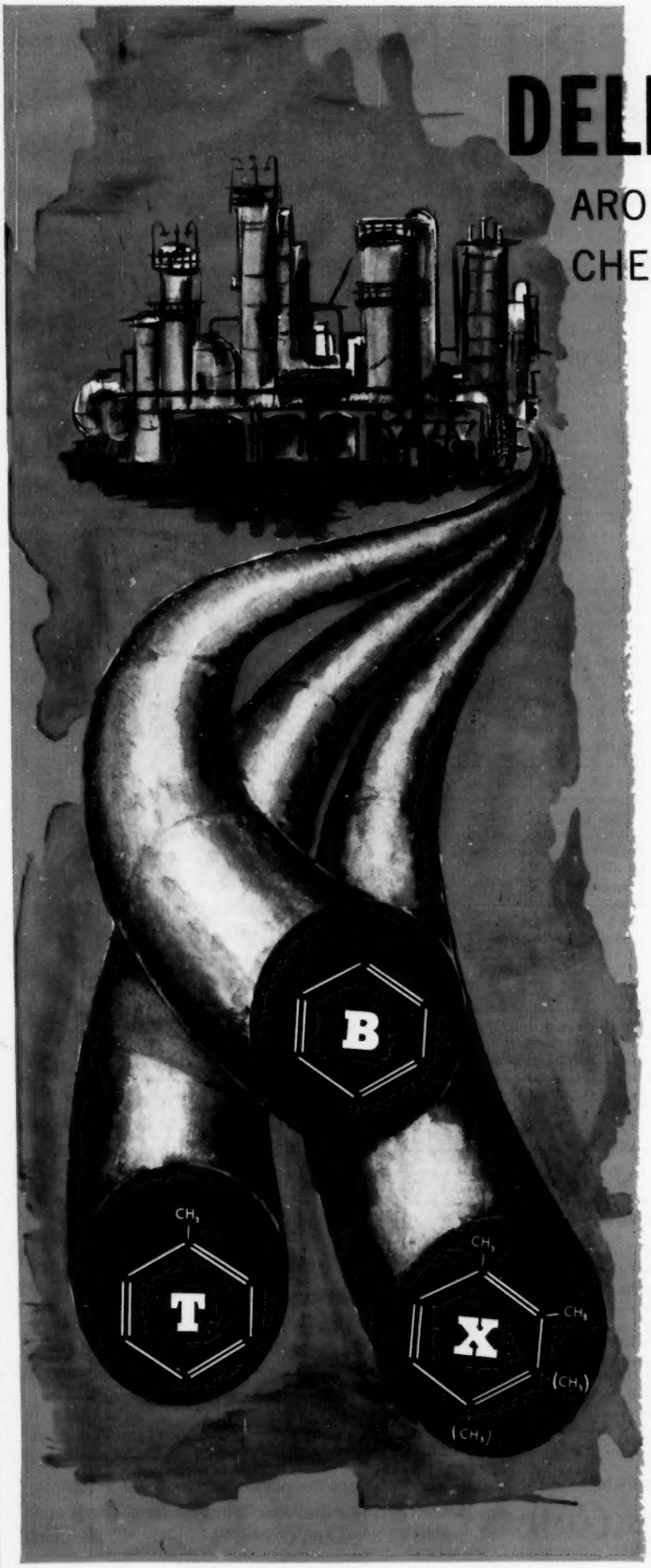
National Plant Food Institute, New England fertilizer conference, Bald Peak Colony Club, Melvin Village, New Hampshire, Sept. 25.

American Oil Chemists' Society, 31st meeting, Netherland Hilton Hotel, Cincinnati, Sept. 30-Oct. 2.

Joint Military-Industry Packaging and Materials Handling Symposium; theme: packaging and materials handling in action; Fort Lee, Va., Oct. 1-3.

National Electronics 13th annual conference, Hotel Sherman, Chicago, Oct. 7-9.

Chemical Institute of Canada, biochemistry division; symposium: the chemistry and physiology of fats; University of Ottawa, Ottawa, Oct. 9-10.



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Using a combination UOP Platformer–Udex process with an annual production of 45,000,000 gallons, the new Delhi-Taylor plant is equipped with the most up-to-date process control systems, insuring product quality and uniformity to meet the most stringent specifications.

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CHEMICAL DIVISION

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YTTRIUM

Availability of high purity yttrium and rare earth oxides

A report by LINDSAY

Only three years ago, most high purity rare earths were little more than laboratory curiosities.

Today they are extensively used for an amazing variety of chemical and industrial applications.

What happened? Lindsay technicians pioneered the first commercially installed ion exchange unit for the production of separated rare earths. The process was patterned after techniques developed by Doctors Spedding and Powell of the Institute for Atomic Research at Ames, Iowa.

Lindsay's pilot plant rare earth ion exchange installation had 40 six-inch columns. This unit made purified rare earths available to industry for the first time in practical, even though still limited, quantities.

The response from industry was so enthusiastic, we were forced to expand our ion exchange facilities rapidly. Today we have in continuous operation more than 100 columns with large production units of eighteen-inch and sixty-inch diameters.

With our larger production facilities, we are now making prompt shipments of high purity yttrium and rare earth oxides in quantities from a gram to hundreds of pounds.

TYPICAL MAXIMUM IMPURITIES IN LINDSAY PURIFIED RARE EARTH AND YTTRIUM OXIDES

ATOMIC NO.	OXIDE	CODE	PURITY	% RARE EARTH MAXIMUM IMPURITIES AS OXIDES
57	La_2O_3. LANTHANUM OXIDE	528	99.99	0.01 Pr, 0.001 Ce.
		529	99.997	0.0025 Pr, 0.0005 others
58	CeO_2. CERIC OXIDE	215	99.8	0.2 (largely La + Pr + Nd).
		216	99.9	0.1 (largely La + Pr + Nd).
59	Pr_6O_{11}. PRASEODYMIUM OXIDE	726	99	1 La + Nd + smaller amounts of Ce and Sm.
		729.9	99.9	0.1 Ce + Nd.
60	Nd_2O_3. NEODYMIUM OXIDE	628	95	1-4 Pr, 1-4 Sm, 0.5-1 others.
		629	99	0.1-0.4 Pr + 0.1-0.4 Sm + 0.5 others.
		629.9	99.9	0.1 (largely Pr + Sm).
62	Sm_2O_3. SAMARIUM OXIDE	822	99	0.2-0.7 Gd, 0.2-0.6 Eu, and smaller amounts of others.
		823	99.9	0.1 (largely Nd + Gd + Eu).
63	Eu_2O_3. EUROPIUM OXIDE	1012	98-99	1-2 Sm + smaller amounts of Nd + Gd + others.
		1011	99.8	0.2 (largely Sm + Gd + Nd).
64	Gd_2O_3. GADOLINIUM OXIDE	928.9	99	1 Sm + Eu + trace Tb.
		929.9	99.9	0.1 Sm + Eu + trace Tb.
65	Tb_4O_7. TERBIUM OXIDE	1803	99	1 Gd + Dy + Y.
		1805	99.9	0.1 Gd + Dy + Y.
66	Dy_2O_3. DYSPROSIUM OXIDE	1703	99	1 (largely Ho + Y + Tb + small amounts of others).
		1705	99.9	0.1 Ho + Y + traces of others.
67	Ho_2O_3. HOLMIUM OXIDE	1603	99	1 (largely Er + Dy + small amounts of others).
		1605	99.9	0.1 Er + Dy + traces of others.
68	Er_2O_3. ERBIUM OXIDE	1303	99	1 Ho + Dy + traces Yb and Y.
		1305	99.9	0.1 Ho + Tm.
69	Tm_2O_3. THULIUM OXIDE	1405	99.9	0.1 Er + Yb + trace Lu.
		1403	99	1 Er + Yb + trace Lu
70	Yb_2O_3. YTTERBIUM OXIDE	1201	99	1 Er + Tm + trace Lu.
		1202	99.9	0.1 Tm + trace Lu + Er.
71	Lu_2O_3. LUTETIUM OXIDE	1503	99	1 Yb + Tm + traces of others.
		1505	99.9	0.1 Yb + Tm + traces of others.
39	Y_2O_3. YTTRIUM OXIDE	1112	99	1 Dy + Gd + traces Tb and others.
		1115	99.9	0.1 Dy + Gd + traces Tb
		1116	99.9+	Approx. 0.05 Dy + Gd.

COSTS GREATLY REDUCED

Of course, as production of purified rare earths increased, costs came down. For example, only three years ago Terbium Oxide cost $500 a gram. Today you can obtain moderate size lots at less than $3 a gram.

Now that you know these high purity oxides are so readily available and the cost so remarkably low, what are *you* waiting for?

Rare earths, in purities up to 99.99%, have captured the interest and imagination of scientists in many industries as valuable new tools for the improvement of processes and products.

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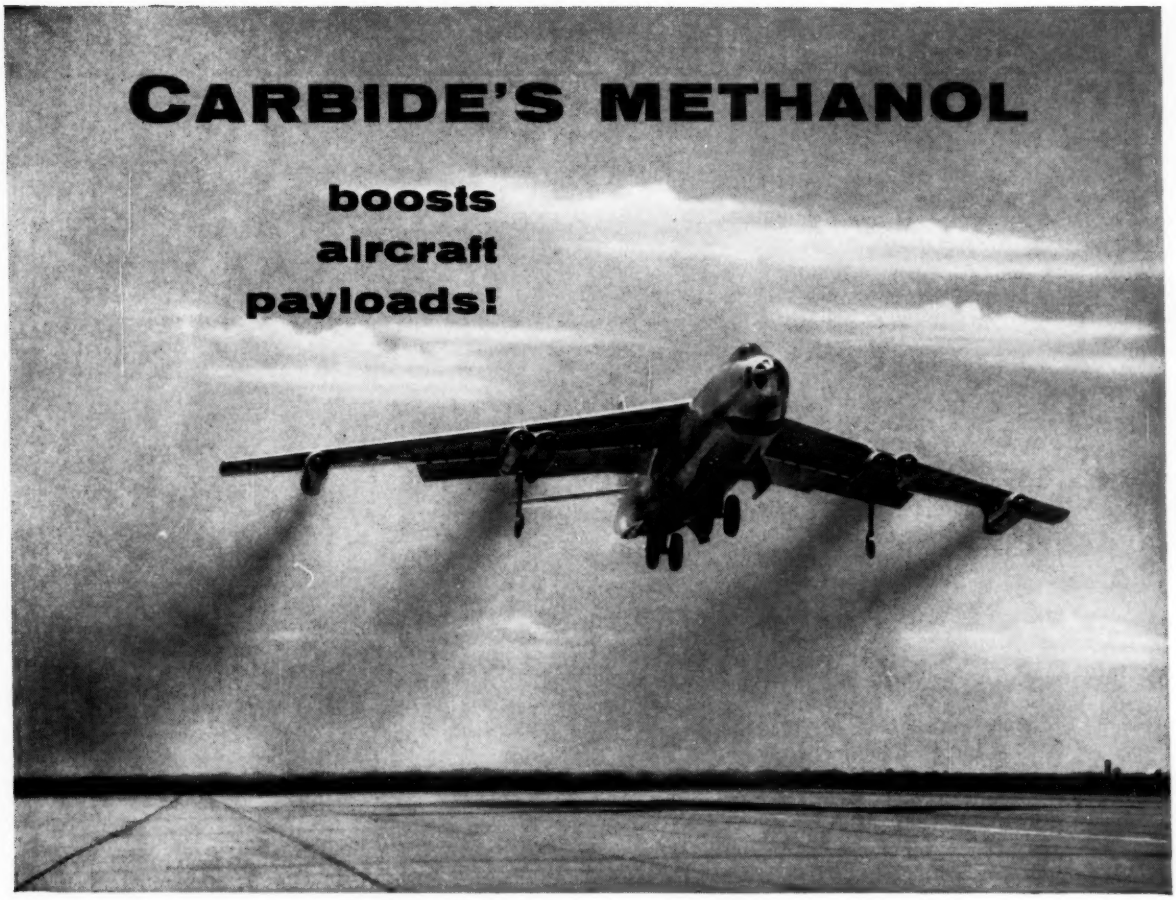

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Added take-off power means higher payloads. And power output can be boosted for both modern turbo jets and conventional propeller engines. How? Simply by using an inexpensive methanol-water mixture, made from CARBIDE's methanol. In turbojets this mixture gives greater thrust and acceleration during take-off than jet fuel alone. Propeller engines gain 15 to 17 per cent horsepower.

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- Has a minimum purity of 99.85 per cent methanol by weight
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- Bulk stations are strategically located for your convenience

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Division of Union Carbide Corporation
30 East 42nd Street, New York 17, N. Y.

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Photo Courtesy of United States Air Force.

Chinese Throne (1736-1795 A.D.) features cinnabar-red lacquer. Fine furniture and fine finishes have been treasured in all the ages.

For the finest in finishes ... *use ketone solvent systems*

KETONE SOLVENT SYSTEMS produce superior finishes in almost any formulation at no increase in production cost. Why? Because they yield solutions of higher solids, or permit greater diluent content, with either aliphatic or aromatic solvents. Another advantage, ketones assure complete flexibility in formulating. You add the latent solvents *you* prefer.

The Shell Chemical "Quality Group" of active solvents includes Acetone, MEK, MIBK, EAK, and DAA as well as latent solvents MIBC, IPA and Industrial Ethyl Alcohols. Your Shell Chemical technical representative will gladly discuss with you the advantages of ketone solvents in your own lacquer formulations.

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SHELL

Business Newsletter

CHEMICAL WEEK
September 14, 1957

Nuclear electric power plant construction now faces the same delays—public hearings—that have presently stalled the start of work on the Niagara Falls, N.Y., hydroelectric station (*see p. 25*). The Atomic Energy Commission last week postponed issuance of construction permits for Yankee Atomic Electric Co.'s 110,000-kw. plant proposed for Rowe, Mass., as well as for the National Advisory Committee on Aeronautics' test reactor slated for Plum Brook Ordnance Works (near Sandusky, O.).

AEC held up the permits, which it had indicated would be granted soon, because a section of the just-signed law—providing federal insurance against a major atomic accident—requires the hearings. This provision was written in, Washington observers say, because of AEC's handling of the reactor power station proposed by Power Reactor Development Corp., which hopes to construct a plant not far from Detroit, Mich.

PRDC, meanwhile, continues to face opposition from AFL-CIO United Auto Workers, which claims the proposed plant is a serious safety hazard. The union, which, according to some observers, may be using delaying tactics because it favors publicly owned nuclear power stations, has most recently convinced the Canadian city of Windsor, Ont., that the PRDC plant constitutes a hazard. And Windsor's city council sought to have the Canadian government intervene with the U.S. government to squelch the PRDC plant. It is unofficially understood that the Canadian Atomic Control Board has more or less tabled the Windsor proposal.

Canada will check with Washington on other atomic matters. Canadian producers of uranium are reported to be worried about future markets—they're selling uranium now at premium prices under contracts expiring March 31, 1962; they seek word on whether the U.S. will renew its contracts at the high prices, or whether ordinary market prices will prevail.

Canadians have already indicated that all countries seeking to buy uranium from it (other than the U.S.) must first agree not to use the fissionable material for atomic weapons.

Uranium price prospects have upset plans for a uranium mill. Ohio Oil Co. and Arthur E. Pew have deferred their plans to construct a mill to concentrate uranium from lignite found in western parts of North and South Dakota. "Pending . . . improved ore processing, or a greatly increased demand," Ohio figures it couldn't produce economically—at least with uranium oxide now priced at $10.50/lb.

But more proposals for atomic power stations are being filled with AEC, despite the delays to other groups, and the problems of suppliers. South Carolina Electric & Gas Co., Carolina Power and Light Co.,

Virginia Electric & Power Co. and Duke Power Co. have combined to form Carolina-Virginia Nuclear Power Associates, Inc., and seeks to build a 17,000-kw. reactor. It would use slightly enriched uranium as fuel, with heavy water as coolant. The group wants to have AEC pay part of the development costs and waive fuel costs; plant construction and operation would be underwritten by the private firms (*CW, Aug. 31, p. 39*).

•

Procter & Gamble launched a $900,000/year aid-to-education program last week, by far its largest grant yet made to education. Neil McElroy, P&G president, who will shortly become U.S. Secretary of Defense, outlined the plan. Besides continuing P&G's present program of $400,000/year for undergraduate scholarships, $110,000 for post-graduate fellowships and $80,000 for various college education funds, the firm is adding $310,000 for new university programs.

Some $200,000 of the new grant will be shared equally by 10 universities; the rest will be parceled out to 39 state and regional associations of small and medium-size independent schools.

•

Rumania apparently will be next to sign with Chemstrand to make acrylic fibers under Chemstrand's patents. A Rumanian delegation headed by Minister of Petrochemicals Florescu is now in this country and seeks to acquire the Rumanian—and possibly Balkan or even wider—rights.

Chemstrand has already acquired the necessary license from the U.S. government, so there are no further government obstacles in the way. And Rumania, which profited well a few months ago selling oil during the Suez crisis, is prepared to pay cash on the barrelhead. The Rumanian group is also looking over other opportunities for acquiring chemical processes or machinery. The U.S. State Dept. looks favorably on dealings with satellite nations as long as they are confined to peaceful trade.

•

But Russia, too, is offering chemical aid beyond its usual sphere. The Soviet Teknoexport Co. has contracted to build a caustic soda and calcium plant in Turkey. Teknoexport has already signed to construct a glass factory there.

•

West Texas is the scene of a Dow Chemical mercury search. Dow is looking for metal in the Maravillas area, about 75 miles southwest of Terlingua, where mercury has been mined for years.

Dow is also increasing its polyglycol facilities at its Freeport, Tex., plant. In addition to increased capacity in ethylene glycol, the new facilities will turn out polypropylene glycols (new for Dow at Freeport).

BRIEFS for buyers of

Caustic Potash
Sodium Sulfide and Sulfhydrate
Oxalic Acid
Benzoic Acid
Phosphoric Anhydride

Wet or dry How do you like your KOH?

If you're one of the relatively few people who prefer caustic potash in the solid state, we can provide you with any of these *seven* forms, all at 90% KOH:

1. Solid
2. Flake
3. Granular
4. Walnut
5. Broken
6. Powder
7. Crushed

If one of these won't do, we can ship you 85%-strength KOH of even higher purity, in *flake* or *solid* form.

If you prefer your caustic potash *liquid* (it's generally cheaper and easier to handle), you can get it from us in concentrations between 45% and 52%, delivered in 55-gallon drums, tank cars of 4,000-, 6,000-, 8,000-, or 10,000-gallon capacity—or in duplex tank cars holding 3,000 gallons per compartment.

Is all this fuss worth while over a specialty alkali like caustic potash?

Well, our customers tell us it is. And they buy, under the NIALK® label, about half the caustic potash sold in this country.

We hope you'll think so, too.

Sulfides in new drum easier to empty or re-use in your plant

Your operators will like the convenience of this new 400-lb. drum in which you can now purchase Hooker sodium sulfide and sodium sulfhydrate.

The opening is 18 inches in diameter—four inches wider and 65% larger in area than the former container.

This drum is much easier to empty with a scoop or shovel. It saves time and is safer when pouring, too. Flakes don't pile up around the opening when drum is inverted.

You'll also like the way this drum safeguards the exceptionally low iron content of our sulfide or sulfhydrate until you're ready to use it.

Only brand-new drums are shipped; none are re-used. A lacquer lining prevents iron pickup during shipping and storage. Six lugs hold the lid on tight, and let you reseal the drum to protect any unused product.

There's no increase in price for the new drum. To get its extra convenience and safety, just specify *Hooker* sodium sulfide or sodium sulfhydrate on your next order.

Oxalic acid in mixed truckloads

The distributor who keeps you supplied with Hooker chemicals can serve you even better now, if you're buying oxalic acid in l/c/l quantities.

He has, or can quickly get for you, OLDBURY® oxalic acid assaying 99.8% minimum.

It comes in two pure white crystal sizes, No. 2 fine and No. 3 fine, packed in 100-lb. and 300-lb. Leverpak containers.

Ask your HOOKER distributor to put a container or two of OLDBURY oxalic acid in with your next order. Meanwhile, a check on the coupon will bring you specifications, typical analysis, particle size, and other data.

Benzoic acid: two high-purity grades

Another area where you'll find your Hooker distributor ready to help is in your use of *benzoic acid.*

To match your process needs and economics, you can get this Hooker product in either of two grades. U.S.P. grade assays 99.3% min., with water content 0.2% max. Technical grade, also a high-quality product, has 98.0% purity with 0.2% max. water.

Check the coupon if you'd like more complete technical data on benzoic acid or its companion product, *sodium benzoate* which we also supply on U.S.P. and technical grades.

What do you want to dehydrate?

If you have a *drying* problem, don't overlook *phosphoric anhydride,* P_2O_5. This OLDBURY product is one of the strongest known desiccants.

A white fluffy powder assaying 98% min. P_2O_5, it contains no sulfate. This is an important advantage in one of its major uses—as a condensing agent in making clear methacrylate resins.

If you're interested in phosphoric anhydride for a present or a potential use, just check the coupon for more complete information.

For more information on chemicals mentioned on this page, check here:

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- ☐ Sodium Sulfhydrate
- ☐ Oxalic Acid
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- ☐ Sodium Benzoate
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- ☐ New list of products—Bulletin 100-A

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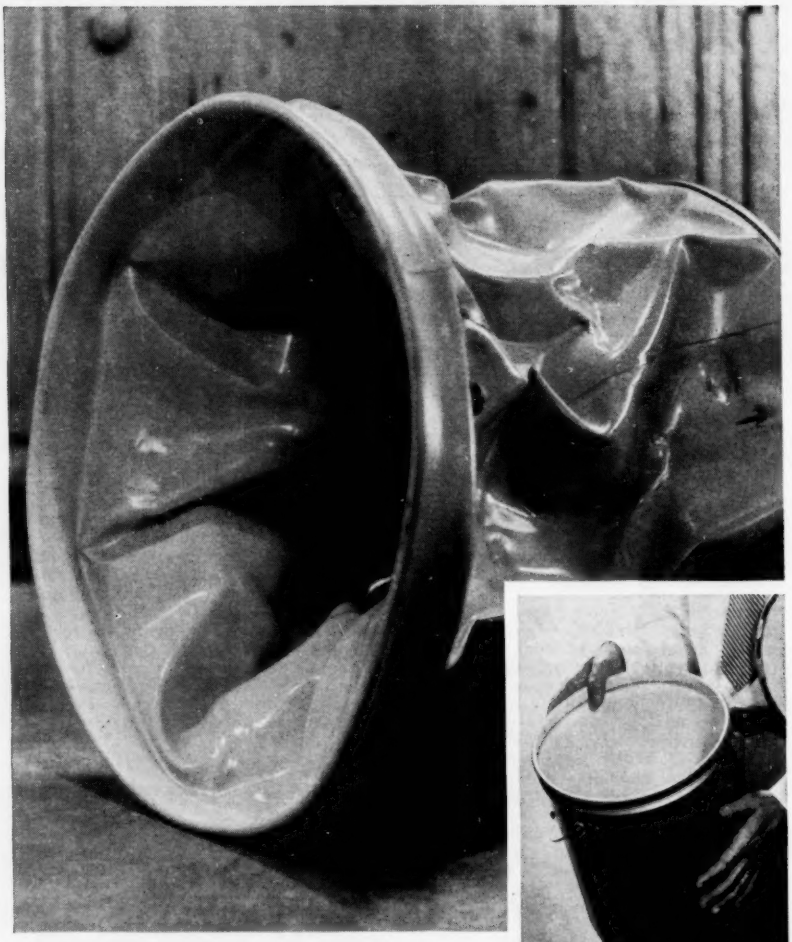

Inland Steel Container Company, *Chicago, Ill. offers drums and pails with this lining in a range of sizes from 1 to 65 gallons.*

LOOK CLOSELY at this intentionally mangled steel drum. No cracks, flaking or peeling of the corrosion resistant coating—an organosol based on Geon polyvinyl resin.

Inland Steel Container Company offers this RDL-4 lining on drums and pails for handling highly corrosive liquids, bulk granulars and abrasive solids.

Linings made from Geon are remarkably resistant to abrasion, acids, alkalis and most chemicals. They are long-lasting, have excellent adhesion and high elasticity and are unaffected by temperature extremes or aging.

Geon-lined steel drums and pails have already been proved successful as shipping containers for many materials. Some of these include: corrosive chemicals, aqueous non-solvent solutions, water emulsions, detergents, disinfectants, 50% lactic acid, phosphoric acid, slurries and abrasive materials like titanium sponge and slips for pottery.

You can put versatile Geon resins and compounds to work for you in many ways. For more details, write Dept. FH-6, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

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PROCESS FIRMS' 4th-QUARTER SPENDING PLANS*

(millions dollars)

	4th Q. '57 (est.)	Change-from 3rd Qtr.	3rd Qtr.	2nd Qtr.	1st Qtr.	4th Qtr. '56
Chemicals and allied products	494	—3.7%	513	435	353	438
Paper and allied products	199	−17.0	240	216	192	237
Petroleum and coal products	869	−6.5	929	892	728	892
Primary nonferrous metals	259	+2.8	252	217	147	152
Stone, clay and glass products	158	+1.9	155	156	135	201
Rubber products	55	+1.9	54	53	46	61
All process industry group total	2,034	−5.1	2,143	1,969	1,601	1,981
All manufacturing total	4,089	−7.4	4,414	4,183	3,505	4,428

*U.S. Dept. of Commerce; Securities & Exchange Commission.

Chemical Spending Plans Take a Tumble

For the first time in two years, U.S. chemical process industries—and, in fact, all industries—are planning to actually reduce their expenditures for new plant and equipment, according to a new survey released Wednesday by the Securities & Exchange Commission and the Commerce Dept.

The change—if borne out—will bring a 5.1% reduction in the fourth quarter of this year for chemical processors, compared with the third, on a seasonally adjusted basis.

Despite the dip—indicated in the intentions of businessmen as reported to the two government agencies—expenditures for 1957 as a whole are being sustained at record high level —6% above '56. Last year, however, the gain was 22%. The indicated level for '57 is $37.03 billion, compared with $35.08 billion in '56.

Chemicals, nonferrous paper products and related industries will join the fourth-quarter decline, if one actually develops. They continue, however, to ring up substantial year-to-year gains. Nonferrous metals show the largest year-to-year gain of any group—100%, while chemical concerns are running 20% above a year ago.

The SEC-Commerce investigators present the findings of their survey in two forms. The figures in the chart above are based on returns exactly as received by the companies taking part. The big drop from the third to the fourth quarter in these figures is not taken too seriously by the government analysts because fourth-quarter expectations are consistently lower than actual expenditures.

To correct for this and other factors—such as the slowdown of construction in winter—the SEC-Commerce statisticians also construct a set of seasonally adjusted estimates. This set is the one followed most closely by economists who seek clues to general economic trends in the course of capital goods expenditures. This set of adjusted figures is the one that discloses the small dip in the fourth quarter, ending a solid two-year succession of quarterly increases.

In '56, the seasonally adjusted quarterly increases (expanded to an annual rate basis) for all industry ran this way: first quarter, $1.4 billion; second quarter, $1.7 billion; third quarter, $1.4 billion; fourth quarter, $600 million. That slowdown in rate of gain for the fourth quarter was significant. It introduced the slower pace that characterized the first three quarters of this year. The first-quarter gain this year was $430 million; second quarter, $140 million; indicated in the third quarter, $260 million.

If present intentions are borne out, the fourth quarter of this year will show a small ($6 million) drop from the third quarter.

And many things can happen to change this indicated trend by the time fourth-quarter actual figures are in. But economists will accept these preliminary findings as a sign that the flattening out of plant and equipment expenditures is at least continuing, and may even be entering a decline.

Metals executives* plan latest move in consolidation.

Planning a Metals Push

Last week, National Distillers & Chemical Corp. came up with the second step in plans to consolidate its position in the manufacture of titanium, zirconium and other reactive metals.

Distillers, along with its titanium-manufacturing partners, P. R. Mallory & Co. and Sharon Steel Corp., will form—sometime before the end of the year—what they call the "first fully integrated company to research, develop and manufacture nuclear-missile-age metals." These metals include titanium, zirconium, hafnium, columbium and tantalum.

Shuffle: On a corporate basis, the new company will be a reorganization of Distillers' present partnership with the two companies. The firm is to be named Mallory-Sharon Metals Corp. The firm, whose assets will amount to about $55 million, will be equally owned by the three firms.

Currently, Mallory and Sharon each own a 50% interest in Mallory-Sharon Titanium Corp. In turn, this firm owns a 50% interest in Reactive Metals, Inc., with Distillers. The formation of Reactive Metals was Distillers' first step toward "atomic metals" integration. In effect, Mallory-Sharon Titanium and Reactive Metals will be consolidated to form the new corporation, Mallory-Sharon Metals.

Besides putting up equity capital for the new firm, Distillers will take up $12.5 million of Mallory-Sharon debentures, bringing its total investment in the light metals to about $24 million. At the same time, Mallory-Sharon Metals will take over the titanium and zirconium plants now being built by Distillers. The latter will operate the plants and continue to do research in the metals field—all under contract with the new firm.

Ready Market: The new company, Distillers President Jack Bierwirth told *CW*, will provide a ready market for the titanium and zirconium sponge that Distillers would have had to sell itself under the present setup. Moreover, it enables Distillers to carry the production and development hazards in the form of an investment rather than a direct operating cost. According to the managements of the three partners, Mallory-Sharon will be capable of producing more titanium in 1957 than it can sell.

The company will produce and ship in '57 about 20-25% more than the 1,250 tons it produced in '56. In the first half of this year, Mallory-Sharon Titanium Corp. earned about $1,006,000, expects to earn another quarter million during the rest of its 1957 existence.

Main reason for the integration, of course, is to bring together the research, development, sponge-making and fabricating facilities of the three organizations. Expectations, according to the managements, are for broad uses of titanium as an "ordinary metal for special purposes" in marine applications and construction fields, and for a more than $100-million zirconium market by '60.

As to the broad future, says Distillers Vice-President Robert Hulse, hopes are that as costs and prices come down, markets will broaden even more. It is thought, he says, that by using Distillers' sodium-dispersion reduction process, the firm can produce titanium sponge for "well under $2/lb." At the present time, sponge is selling for $2.25/lb.

In seeking lower manufacturing costs, the firm believes it has a big advantage over competitors because its investment per pound of sponge need be only about 30-35% of the investment of companies using the older Kroll process. (Such firms include another jointly owned firm, Titanium Metals Corp. of America.) In addition, the Distillers process is believed broadly applicable to the refinement of the other metals.

New Metals: Mallory-Sharon Metals will put strong emphasis on the newer light metals. Plans already in the works include a columbium-tantalum plant; construction will start sometime in the next 8-10 months. At the outset, says Bierwirth, such a plant will probably be owned and operated solely by Distillers, since its output would not be sufficient to interest, even indirectly, participation by Mallory or Sharon.

Distillers has two metals plants now abuilding—a 2-million-lbs./year zirconium facility and a 10-million-lbs./year titanium plant. After completion, say the firms, the units can be readily doubled in capacities.

In zirconium, plans call for production of only reactor-grade material, since the most likely markets at the outset will be commercial reactors.

*Left to right, Joseph Cain, president of P. R. Mallory; Wilbur Blair, vice-president, Sharon Steel; John Bierwirth, president, National Distillers; James Roemer, president, Mallory-Sharon Titanium.

Niagara Power Setback

Electrochemical process firms in the Niagara Falls area got another setback last week in their hopes for an early start on construction of the $600-million Niagara hydroelectric project (*CW Business Newsletter, Sept. 7*). The proposed facilities are designed to bring increased amounts of electric power to the area.

The New York State Power Authority canceled the ground-breaking scheduled for this week, because officials of Niagara Falls, N. Y., and Lewiston, N. Y., couldn't agree to the plans for taking partly covered water conduits through and near Niagara Falls and because they object to the size of a reservoir to be built near Lewiston.

Meantime, the Federal Power Commission, which authorized the Niagara power project, has proposed to hold further public hearings on the conduit and reservoir matters. No date has been set for the hearings. The cancellation may delay building by two or three months; the state authority says engineering changes desired may cost $100 million more.

New Shale Oil Reserves

New analyses of oil shale deposits made by the U. S. Bureau of Mines reveal marked increases in reserves, according to data made available last week. Current estimate of U. S. reserves: about 1.5 trillion bbls., half again as much as an estimate made one year ago.

Core analyses show some beds are much thicker than first believed. In one area, for example, beds formerly thought to contain 150-200 ft. of high-grade oil shale are now known to be 1,500-2,000 ft. thick. In addition, indications are that while some major oil companies hold lands extremely rich in shale, greatest deposits are in public domain lands north and west of company holdings in western Colorado. At least two townships in Rio Blanco County are said to be so rich that a square mile contains the equivalent of 2.25 billion bbls. of oil.

While most of the oil shale of the Green River formation lies in Colorado, the reserves a year ago were estimated at 33 billion bbls. in Utah, 2.6 billion in Wyoming.

V-C's Wilson: No reorganization without better earnings.

V-C Faces Its Future

A slight increase in sales and increased earnings (although special charges dropped net income) brightened the 12-months earnings statement presented last week to stockholders of Virginia-Carolina Chemical Corp.

Sales rose to $70.5 million, from $70.2 million of the previous 12 months (V-C's year ends June 30). V-C had its top sales mark in '54, about $80 million, but it has since sold off its Black Leaf Division, which brought in about $5 million/year in sales.

Net earnings from operations, after taxes, were $1.8 million, 17% over the earnings of the previous period. But net income was only $946,380.

This year's slump in income marks the seventh time in the past nine years that V-C's net income has declined. President William H. Wilson explained that the special charges that cut into earnings this year—the closing and dismantling of a unit to recover uranium from phosphate ores in Florida (made obsolete by discovery of richer ores in the West) and three (of 38) fertilizer plants. (This move will not lower the firm's fertilizer output, Wilson said.)

Wilson also said that the company is considering whether it would be "advantageous to sell all or part of its interest" in the zein-based fiber, Vicara. V-C's plant never operated anywhere near capacity, and Vicara was never a real money-maker.

Recapitalization Ahead? Basically, Wilson seemed to feel that the earnings increases over the period ended June 30 were indicative of improving conditions at V-C. The company, which is in arrears $73.50/share on some 213,000 shares of preferred stock—some 20.5% of it owned by Allied Chemical—may be recapitalized by a plan worked out by the board of directors. But as Wilson points out, "There's not much point in recapitalization until earnings can be improved."

Coal Plant Hold Up

Congressional shelving of a bill to increase the acreage of public coal lands that can be leased by a single firm will delay construction of a $3-million coal carbonization pilot plant at Rock Springs, Wyo.

The Wyoming natural resource board said that Congress' action in postponing the bill will mean at least an eight-month delay in plans of Union Pacific Coal Co. and Husky Oil Co. to construct the test plant.

Under the project, Union Pacific would mine the coal, which would be reduced to char in the extraction of synthetic fuels and other chemicals. Husky Oil will market the liquid fuels through its regular marketing channels.

Fluoridation Support

Powerful support for programs to fluoridate drinking water supplies came last week from the World Health Organization, an arm of the United Nations.

The agency said that studies in 17 foreign countries showed that public health officials were approving fluoridation on a wide scale. According to the agency's report, there was significant uniformity among the results of tests in all the nations: decay in permanent teeth of children was found to have decreased by about 60%, while decay reductions in children's primary teeth were 50-60%.

The organization, basing its conclusions on studies of these groups and those of other countries, recommended use of fluoridated water wherever and whenever possible, without qualification or caution.

Power Cutback Slows Plants

Those power cutbacks by the Bonneville Power (CW, Sept. 7, p. 23) are causing some dislocation of production and personnel in the Pacific Northwest. The power was cut back Aug. 31 as a result of low stream flows supplying Bonneville Dam.

Aluminum Co. of America said that approximately 30% of the total capacity of its Vancouver, Wash., and Wenatchee, Wash., plants would be shut down by the cutoff.

Alcoa declined a BPA offer of provisional power from Hungry Horse Dam. Alcoa said use of provisional power in September "could jeopardize our firm's power supply later on, and in our judgment is not wise."

Others: Kaiser Aluminum & Chemical Corp. said that production might be slowed at its Mead reduction plant, but output would not be affected at the Trentwood rolling mill. Both plants are in the Spokane area. In the past, Kaiser has obtained provisional power from Hungry Horse during interruptible curtailments.

Pacific Northwest Alloys (Spokane), ferrochrome producer, said the curtailment would not affect its Spokane plant because it is not producing at capacity and has not used interruptible power for several months.

Keokuk Electro-Metals expects the power curtailment to result in shutting down one of the four furnaces at its Wenatchee plant.

Anaconda Aluminum Co. said its plant at Columbia Falls, Mont., is not using any interruptible power and will not be affected.

FRANK AMELIA

Neckwear Boost for Teamwork

Process industry firms seeking to boost team spirit among their employees may soon be adding company neckties to their bag of tricks, if the ideas of a New York tie manufacturer pan out.

This week, the firm (G. S. Harvale & Co.) is starting an intensive campaign to bring its specially designed neckties to the attention of companies throughout the U. S. Already a number of chemical companies—among them Du Pont (which, incidentally, ordered ties made of silk), Koppers, Continental Oil, Ansul, Olin Mathieson, Rohm & Haas (whose tie is shown above by Harvale President George Finck), Schering, Tennessee Products—have purchased the cravats. The ties have on them the company trademarks, product pictures, initials, insignia or company colors. They're used for sales promotion, service awards, gifts and other promotion.

Hungarian Complex

Construction of a giant Hungarian chemical complex of 20 plants will soon begin on the Tisza River in Videk province. The complex, said the Hungarian government this week, will revolutionize the nation's chemical industry.

Plans in the works since 1955 call for six units with 20 interlinked plants producing oxygen, acetylene, ammonia, fertilizers, caustic soda, polyvinyl chloride, polyacrylonitrile and basic organic chemicals. The plants' 4,000 workers will include 2,500 chemists, engineers and technicians. Hungarian chemists and engineers are now in East Germany and Czechoslovakia studying processing techniques.

Damper on Imports: Once the plants go onstream—the date hasn't been set—chemical imports are expected to drop sharply, making Hungary less dependent on Red neighbors. Today, for example, Hungary imports 60-70% of its caustic soda from Poland, Red China and Rumania. When the proposed caustic chlorine unit goes onstream, Hungary's caustic soda imports are expected to be sharply cut or eliminated. This facility will also produce potassium chemicals, perchlorates, hydrochloric acid and carbon tetrachloride.

For the artificial fertilizer complex, plans include an acid unit and nitrogenous and potash fertilizer facilities.

The gas plant will include gas-purifying and oxygen units, and facilities for acetylene concentration, and dissolved acetylene collection.

The ammonia plant will consist of gas-decomposing and synthesis plants. Vinyl and acrylic polymers will flow from the synthetic materials unit, while acetaldehyde, acetic acid and alcohol plants will comprise the basic organic chemicals facility.

COMPANIES

Shawinigan Water & Power Co. plans to sell $20 million of convertible debentures this fall, will also split its common and Class A common stock on a 3-for-1 basis. The split will increase authorized common stock to 9.6 million shares and the Class A to 592,500 shares. Stockholders of the company will vote on the plan Sept. 25.

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Pennsalt Chemicals Corp. has formed a wholly owned Canadian subsidiary, Pennsalt Chemicals of Canada, Ltd., to provide improved customer service for its chemical specialties.

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General Plywood Corp. will call in its 964 preferred shares as of Sept. 30. The redemption will complete General's call for the 41,656 shares of its preferred stock outstanding at the beginning of '57. The stock is redeemable at $21/share or may be converted into common stock on the basis of three common shares for each preferred.

•

Dobeckmun Co. stockholders have approved the merger of the company with Dow Chemical Co. As of Sept. 1, the new acquisition will be known as Dobeckmun Co. Division of Dow Chemical. Of the 515,893 common shares of Dobeckmun outstanding, holders of 93.5% ratified the merger proposal. Under terms of the merger, Dobeckmun owners receive three-quarters of a Dow share for each share of Dobeckmun stock.

EXPANSION

Vinyl Acetate: Air Reduction Co., Inc., plans a 50% expansion of its vinyl acetate monomer plant at Calvert City, Ky. This will raise capacity from 30 million to 45 million lbs./year. Onstream date: April '58.

•

Urea: Hercules Powder will build facilities at its Hercules, Calif., location to produce 10,000 tons/year of urea. The company already produces anhydrous ammonia and carbon dioxide at the plant. Construction will start immediately, with completion late in '58.

•

Reactor Cores: Olin Mathieson Chemical Corp, has taken up its options on a site near Montville, Conn., where it will build a small plant to assemble nuclear reactor cores. Completion date: spring of '58.

•

Magnesium: Alabama Metallurgical Corp. will soon start constuction of its $7-million magnesium plant at Selma, Ala., on a 470-acre site near the Alabama River. The new plant will produce 10,000 tons/year (*CW, Aug. 25, '56*). Construction will begin this fall.

•

Pulp: Celgar Development Co. will build a $30-million pulp mill near Castlegar, B. C. The mill, to have a daily output of 300 tons, is the initial step in a proposed $65-million wood products manufacturing industry in the district by Celgar, a subsidiary of Canadian Chemical and Cellulose, which, in turn is affiliated with Celanese Corp. of America. Construction will begin March '58, with completion by March '61.

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Copper Sulfate: Republic Chemical Corp. (New York) has expanded its plant at Baltimore to make pulverized copper sulfate.

•

Oxygen/Nitrogen: Union Carbide's Linde Co. Division will expand its liquid oxygen and nitrogen facilities at Fontana, Calif., by more than 100 million cu. ft./month. Total capacity of the plan will be about 430 tons/day. Other facilities will be added to process argon, xenon, krypton and neon.

•

Phosphate Aggregates: Florida Lightweight Products Co. will build a $250,000, 80,000-tons/year phosphate aggregates plant near Bartow, Fla. It will use phosphate slimes as raw material, reportedly utilizing a newly developed process.

FOREIGN

Pharmaceuticals/Brazil: Merck & Co., Inc., has completed construction of a $2-million pharmaceutical and chemical products plant in Campinas (state of São Paulo). It will go into production this month, is slated to reach full production early in '58. Products will include vitamins B_1, B_2, B_6 and B_{12}, vitamin compounds, steroids, antibiotics, tonics, hormones, sulfa products, medicinals.

While maintaining its Brazilian headquarters in Rio, Merck plans to move a small plant from that city to Campinas.

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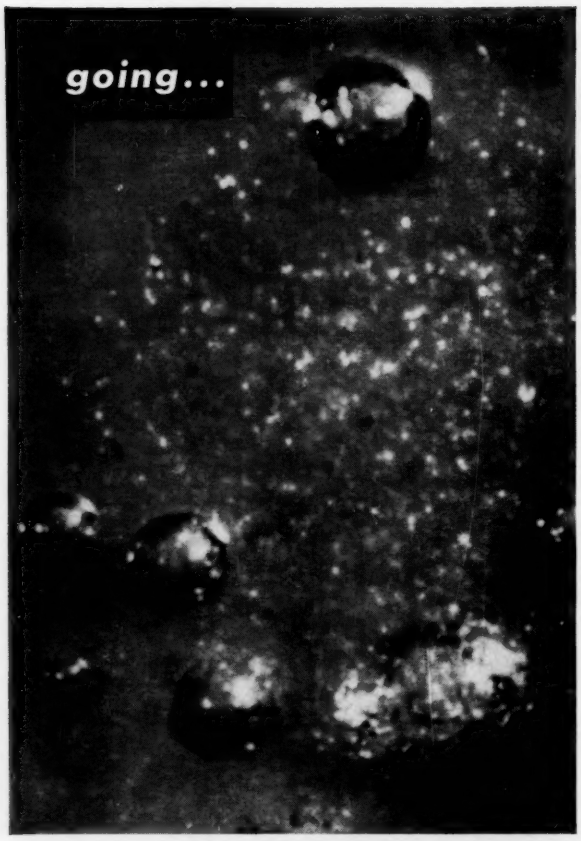
Petrochemicals/England: The British Petroleum Co., Ltd. (London), will set up a petrochemicals manufacturing department.

•

Atomic Power/Japan: Cabinet approval last week of a publicly and privately operated atomic power corporation ended the long dispute over which interests will develop Japanese nuclear power. The Japanese government will pitch in 20% of the $2.8-million capitalization, while nine regional power companies, plus electric appliance makers, will each contribute 40%. The new corporation, tentatively named Atomic Power Electric Generating Co., is considering importing reactors from the U.S. and Britain.

•

Glass/Venezuela: Owens-Illinois Glass Co. will build a glass plant in Venezuela, foresees possible future expansion into production of plastic products. Operation is expected to begin within 12 months.



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Davies-Young's Howard, Russell, John Young: New products, new enterprises keep a firm growing.

They've Kept a 113-year-old Firm Healthy

Dry cleaners who use perchlorethylene solvent (and 37% of them do) will get their first chance to buy a new dry-cleaning detergent next week. The maker, Davies-Young (Dayton, O.), regards the new detergent, Buckeye Code 166, as promising to be the hottest item it has offered to the dry-cleaning field in its 47 years as a supplier.

But Code 166 detergent is not the only new interest of this 113-year-old soapmaker. Though it took the company 66 years to diversify from soapmaking into the dry-cleaning supply field, it lately has been buying or setting up new manufacturing divisions at a rate almost as fast as it has been creating new products.

- In 1948, it bought Amole Cosmetic Co. (Tipp City, O.), moved it into the D-Y plant at Dayton.
- In '51, it set up a subsidiary, Wingwax Inc., to market a line of products for aircraft, including waxes, polishes, cleaners, degreasers and dewaxers.
- In '52, it set up another subsidiary, Bounce Inc., to market the foot balm, Bounce, and other body lotions.

These subsidiaries (all of which operate out of the company's only plant, a four-story, 125,000-sq.-ft. structure), though doing well, account for only a small part of the company's over-all dollar sales at present. Mainstays of the business are the dry-cleaning and bulk products departments.

Relative size of these departments are hard to determine, because the company has been owned by the Young family since 1914 and sales figures are guarded zealously. The company does claim, however, that it's the number one producer of specialty soaps in the country and among the top three producers of soaps, detergents and specialties for the dry-cleaning industry.

Family Affair: Head of the company is Russell H. Young, who took up that post when his father died in late '55. Other members of the Young family are active in the company. One of Russel's brothers, Howard, is sales manager of the bulk department; another brother, John, has that job in the dry-cleaning department. Still another brother, Robert, is legal counsel to the company, and Russell's daughter, Caroline (she's leaving soon to be married), heads Bounce Inc.

"Titles don't mean much here," says Russell. "When we have a board meeting, we just yell down the hall at one another."

Though the company says that sales of its dry-cleaning and bulk departments are roughly the same, dollar-wise, the dry-cleaning department

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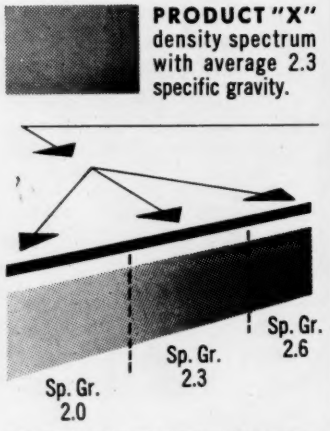

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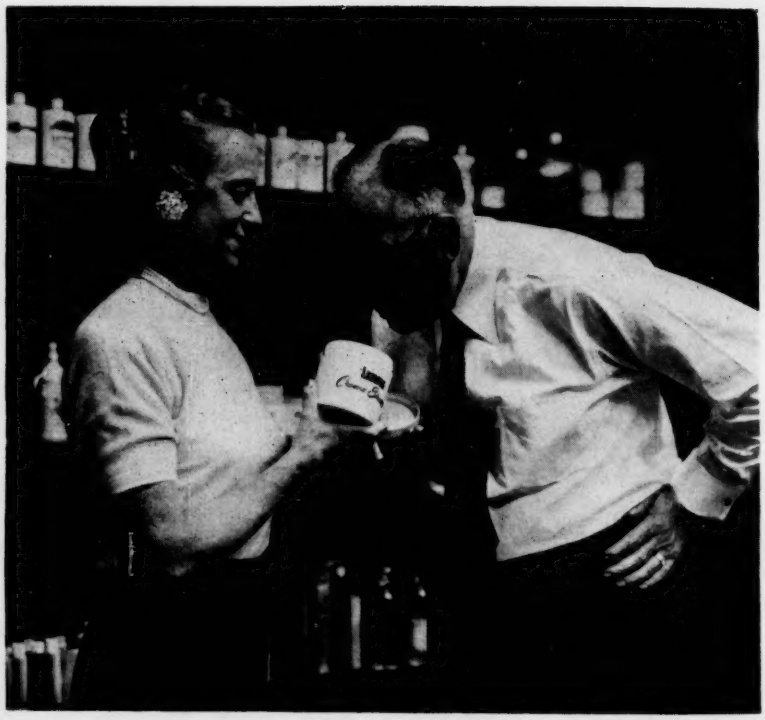

Amole's Brunn and Neff with sweet-smelling 'calling card.'

would seem to be the bigger money maker. It has 21 salesmen to the bulk department's 10; it sells only branded products, while the bulk department makes private-label goods too; and it has fewer jobbers to reach than the bulk department.

First Diversification: It was 1910 when the company first introduced its Buckeye line of dry-cleaning products. It now makes about 30 products for that field. Of these products, the biggest sellers are the dry-cleaning detergents, followed by wet-cleaning soaps, spotters and specialties. The detergents are far and away the biggest seller, and the development of Buckeye Code 166, should move them even farther ahead. Specialties and spotters are good sellers (and growing) but are used in such small volume that they don't add much to over-all sales.

The company sells dry-cleaning products to "full line" distributors only, i.e., those that carry a complete line of dry-cleaning supplies. About half of the U. S.'s 500 dry-cleaning jobbers fit this category.

In selling dry-cleaning supplies, price isn't a major consideration, says Robert Young. Accounting for this is the fact that only about 3-5% of the cost of dry cleaning is for material, while one-third is for labor. A product that will do the job faster or better, cut down on finishing operations or wet washes will usually get the nod over inferior but cheaper materials.

Davies-Young claims a number of firsts in the dry-cleaning field. Among these: a detergent that safely removes paint from colored fabrics (including synthetics) and can be rinsed with either solvent or water; a process for eliminating static electricity in dry cleaning from start to finish.

Soap Sales: The bulk department of the company, an outgrowth of the company's original manufacturing efforts, concerns itself with the sales of detergents, deodorants, floor waxes, floor finishes and liquid dishwashing compounds—almost all of them made to customer specification. These are sold only through wholesalers, about 45% under D-Y's Buckeye label, the rest under the jobber's label. Like salesmen in the dry-cleaning department, the bulk department's salesmen do not sell the ultimate users—stores, buildings, hospitals, etc.—but work through the country's 700-plus distributors of janitors' ("maintenance") supplies. Nothing is sold direct.

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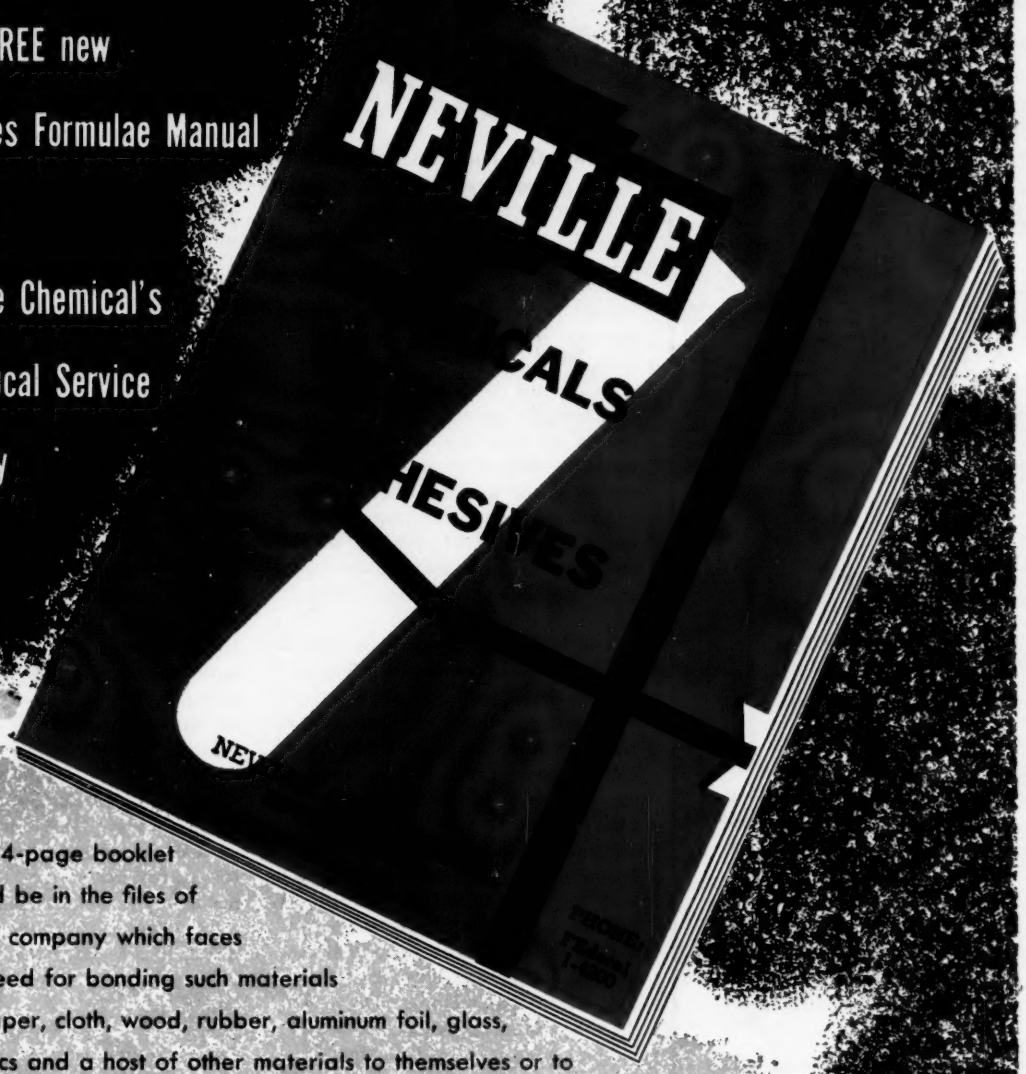

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SPECIALTIES

Biggest items sold in this department are floor cleaners, followed by liquid hand soaps, liquid dishwashing compounds, waxes and deodorants. In addition to products that it makes itself, Davies-Young has recently perfected a toilet deodorant block, the manufacture of which it licenses to others.

Newer Divisions: Amole Cosmetics, which it makes mostly as a private-brand product, has its biggest sales in department stores. Jay Neff is president of this subsidiary, and personally directs sales to beauty salons and drug-stores. These sales are made mainly through manufacturer's representatives.

Lately, the company has found that janitor-supply jobbers are good customers for these cosmetics. It is now doing a brisk business selling cosmetics to the jobbers, who use them as door-openers to buying staffs of hospitals and other institutions. In charge of selling to these outlets (now about 70) is sales manager Gertrude Brunn.

The Wingwax subsidiary is headed by Russell H. Young. In selling his product to military and private plane owners, he became so interested in planes that he has taken up flying. He'll probably turn skipper soon if the firm's soon-to-be-released product called Aquawax has the same effect on him. Aquawax is designed for boats, is basically the same product sold for airplanes. However, Russell feels the market is bigger here—even if he sold Wingwax to all its potential users, he could sell only around 50,000 lbs. of the material yearly. On the other hand, he points out, a half-million boats are sold in the U.S. annually.

Research-Minded: In a large measure, Davies-Young Co. owes its success to its heavy reliance on the work of its research group. Ralf B. Trusler, who heads research for the company and who has been with the company since 1930, oversees the work of the company's seven chemists, has been responsible for some of the company's biggest developments.

Russell Young and his brothers look forward to increased sales in the future. They plan to grab a bigger slice of the business in the $2.5-billion-year dry-cleaning industry. A host of their new products are being tested for the bulk department, and they feel that the cosmetics branch is beginning to realize its potential.

PRODUCTS

All-Purpose Detergent: Kelite Corp. (Berkeley Heights, N.J.) has developed an all-purpose, concentrated, powered detergent tradenamed Kelite APC. The product conforms to specifications for cleaning painted surfaces, including Federal Spec. PC 431, Port Authority No. SN-2 and New York Housing Authority Spec. No. 08-071. It's used in concentrations of ½ to 4-oz./gal. of water, is soluble in hot, cold, hard, soft or saline water.

•

Pousse Pill: Two- and three-layer tablets, with each layer distinctly separate from the other, can now be produced on special rotary tableting presses developed by F. J. Stokes Corp. (Philadelphia). Applications include manufacture of ultraslow-disintegrating tablets, three-layer tablets containing two active materials separated by a middle layer of inert material, and combinations of two or three incompatible materials in separate layers.

•

Lasts a Lifetime: Custom Lubricant Co. (Berkeley, Calif.) has developed what it claims is a life-time lubricant for instruments, meters and precision machinery. Called Custom Lube 101L, the oil is said to remain free from oxidation and gumming for 15 years of service at temperatures up to 140 F.

•

Rubber 'Popcorn': B. F. Goodrich Chemical Co. is now supplying a ready-to-use master batch of Good-rite 2007 and cold nonstaining GR-S in crumb form similar to popcorn. The new product, called Good-rite 2057, can be processed as received, is suggested for use in shoe soles, floor tiling and hard extruded items.

•

Subcap Closure System: Polyethylene inner subcaps are more easily removed using a closure system developed by San Francesco (Florence, Italy). A bottle's outer cap is unscrewed in regular fashion and then inverted. At the top of the outer cap is a smaller cap, which fits into the polyethylene subcap and extricates it.

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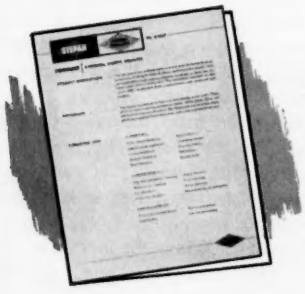
Stepanol WA Paste	Sodium Lauryl Sulfate	Paste	28-30	1.5-3.0	1.4-1.8	1.4-1.8	7.5-8.5	8.67
Stepanol WAQ	Sodium Lauryl Sulfate	Viscous liquid	28-30	1.5-3.0	0.3-0.8	1.4-1.8	7.5-8.5	8.67
Stepanol WA Special	Sodium Lauryl Sulfate	Clear viscous liquid	28-30	1.0-2.5	0.3-0.8	0.5-1.0	7.5-8.5	8.67
Stepanol ME Dry	Sodium Lauryl Sulfate	Powder	90-94	1.5-3.5	1.0-2.0	1.5-3.5	8.5-11.0	
Stepanol ME Dry AW	Sodium Lauryl Sulfate	Powder	90-95	0.5 Max.	1.0-2.0	1.5-3.5	8.0-10.5	
Stepanol WAT	TEA Lauryl Sulfate	Clear liquid	39.50-41.0	1.3-2.0	1.0-2.0	2.3-4.5	7.0-8.5	8.7
Stepanol DEA	DEA Lauryl Sulfate	Clear liquid	33.5-36.0	1.25-3.25	1.3-2.6	2.6-3.5	8.4-8.7	8.58
Stepanol AM	Ammonium Lauryl Sulfate	Viscous liquid	28-30	1.5-3.0	0.5-2.0	1.5-2.0	5.5-6.5	8.53
Stepanol T-28	Special Sodium Lauryl Sulfate	Viscous liquid	35.5 Min.				9.0	8.6



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Included are suggested formulations for a wide variety of liquid, liquid creme and paste shampoos as well as hand cleaner, shaving cream, rug shampoo, and bubble bath formulations.

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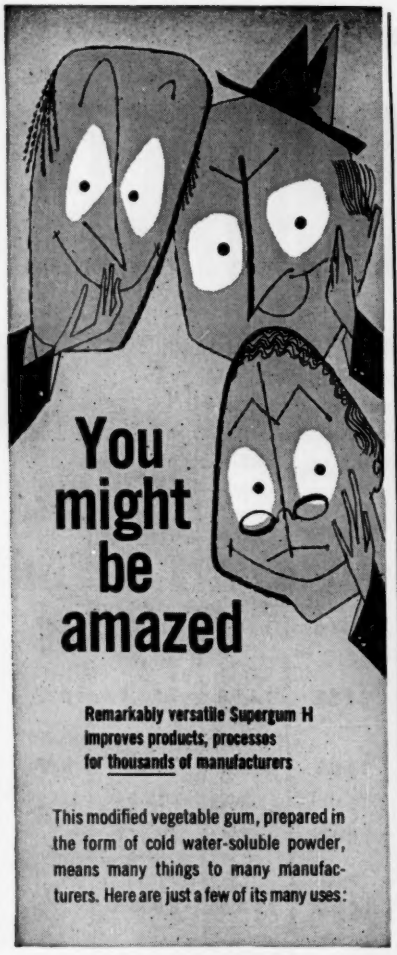
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Remarkably versatile Supergum H improves products, processes for thousands of manufacturers
This modified vegetable gum, prepared in the form of cold water-soluble powder, means many things to many manufacturers. Here are just a few of its many uses:
SOAPS, DETERGENTS—as a soil suspending agent added to the product or the laundry wheel.
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RESINS, PAINTS, LATEX—in combination with glues, starches, and gums, it gives good adhesion to cardboard, wallpaper, glass, aluminum surfaces.
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Supergum H may improve your product or process, too! Write for test sample and further information. No obligation, of course.
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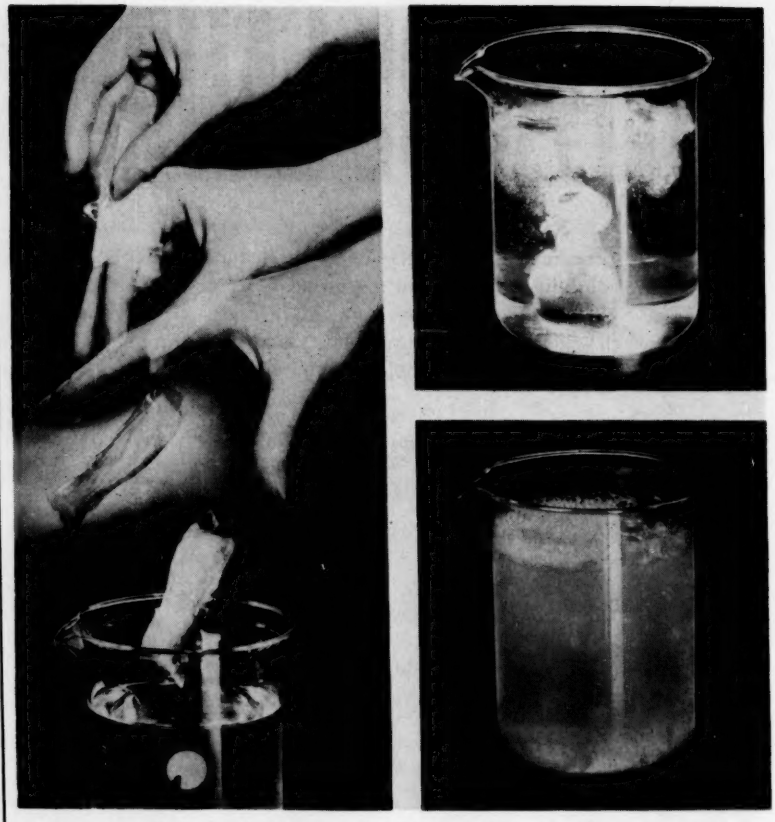

Dye wrapped in PVA film is released as film dissolves in water.

PVA Film Goes Commercial

Water-soluble packaging film made from polyvinyl alcohol will take its first faltering steps into the commercial market soon. Scheduled to make appearance in test markets by November is a line of PVA-packaged household dyes, tradenamed Putman Fadeless Dyes, made by Monroe Chemical Co. (Quincy, Ill.). The novel packages will save the housewife the trouble of opening the dyes; she merely drops the whole packet into water—it dissolves and releases the dyestuff.

Monroe is getting its film from Mono-Sol Corp. (Gary, Ind.), pioneer supplier of the internally plasticized polyvinyl alcohol film, and up to now the sole source of the material. This "Hobson's choice" of supplier has recently been changed, however. Reynolds Metals Co.'s Plastics Division (Grottoes, Va.) has just come out with a film of its own and is currently wooing customers. Dow Chemical tells *CW* that reports that it is working on the PVA film are inaccurate—it says it has no such project.

Reluctant Packagers: All this activity now seems strange in light of the fact that heretofore nobody had come up with a commercially successful item in this transparent packaging material, although it has been kicking around for some years. One pioneer product packed in PVA film was Renflo Chemical Co's. (Island Park, N.Y.) In-Sac-Inside—a garden spray *(CW, Aug. 28, '54, p. 82)*. It never achieved large-volume sales.

One of the main reasons why PVA films have been slow to break into the packaging field is that early commercial films were not stable under all weather conditions. Films were too hydroscopic. When the humidity was high, they took on water, softened and became sticky. Today's greatly improved films are said to be completely stable in conditions of high humidity—but become more elastic

as humidity nears 100%. Too, they're said to be unaffected by light and are claimed to have an almost indefinite shelf life. They have an average tensile strength of about 6,000 psi. and have good tear resistance.

"With technical difficulties out of the way," the potential market looks good, Mono-Sol told *CW*. Products that might benefit from water-soluble packages include insecticides, which would never have to be touched, eliminating the danger of poisoning the gardener or farmer. Preweighed medicinals, enzymes and sterilizing compounds, fertilizers, paints and antirust agents are other possible uses. Mono-Sol—which has been producing PVA film for over a year—isn't overlooking the food market either.

Future—Food Packaging: "Our product has no bad taste," says Mono-Sol. Because PVA film is impervious to oxygen, hydrogen, helium and nitrogen, it appears to be an ideal package for fatty materials, keeping them from becoming rancid. But, PVA film food packaging is still in the future. Though researchers have found that it is not absorbed by the body, PVA film has not yet been approved by the Food & Drug Administration nor by the public for internal consumption.

Greater Cost: Du Pont, Borden Co.'s Chemical Division (New York) and Colton Chemical Co., division of Air Reduction (Cleveland), are major suppliers of the resin—shipped to Mono-Sol and Reynolds in powdered form. Suppliers furnish the dry resin at $1.40/lb. for small lots. For large orders (20,000 lbs.) the price reduces to about 80¢/lb.

Reynolds PVA film, sold in 10,000-lb. lots, is available at a cost of $1.85/lb.—about 15,000 sq. in. of 1.5 to 2-mil film. Mono-Sol film is also priced at $1.85/lb., but may drop in price soon. Cost comparison of PVA film with other packaging mediums is significant—cellophane is available at 62¢/lb., and polyethylene sells for 53¢/lb.

Although Monroe dyes are the first commercial products in this special packaging, others will soon be in the field. It appears that when the package finally shows up on market shelves it will do so in a rush. Said to be experimenting with PVA water-soluble packaging are Lilly, Monsanto, Pfizer, Procter & Gamble, American Viscose and Pabst.

Patronize one store more than any other?

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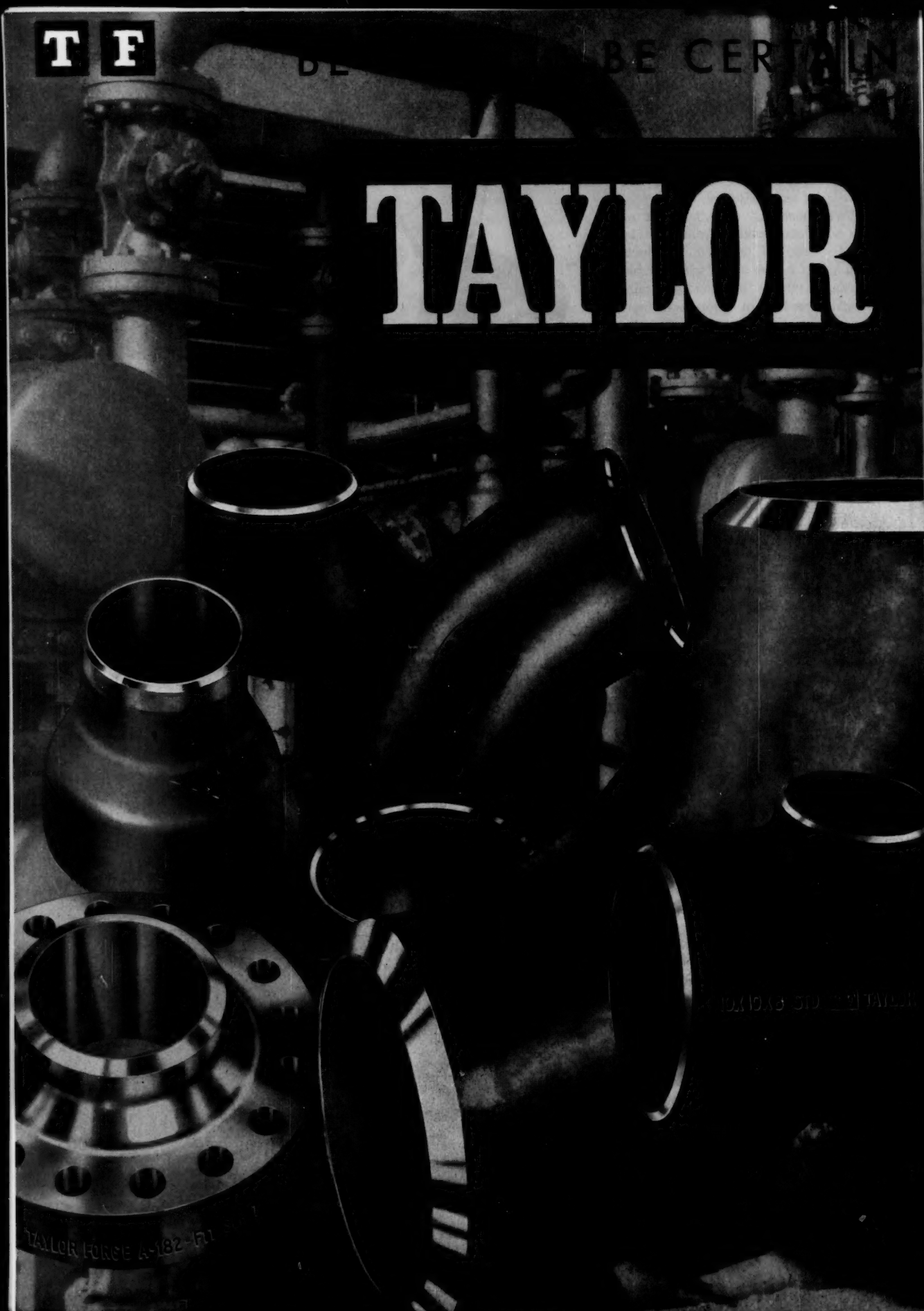
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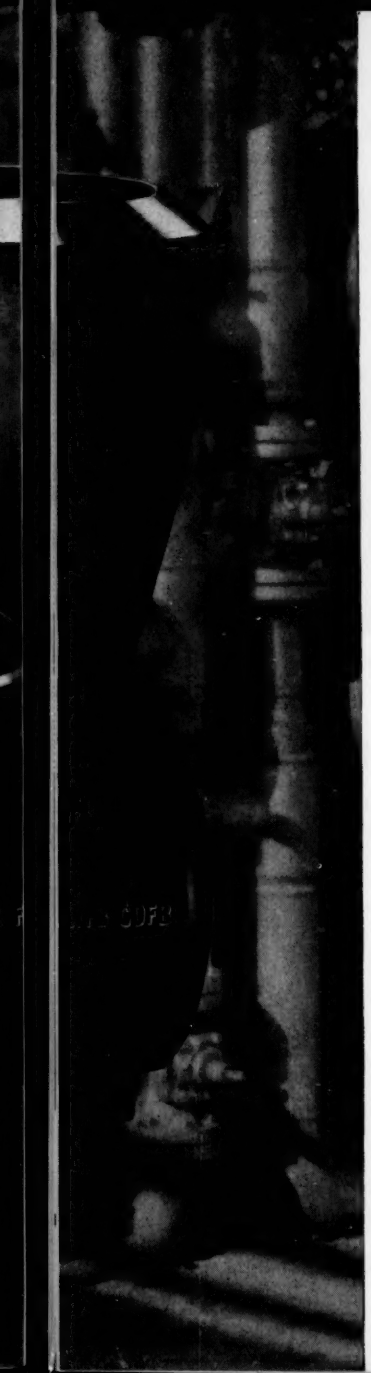

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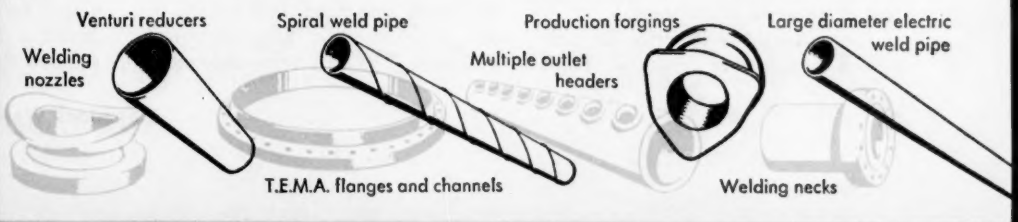
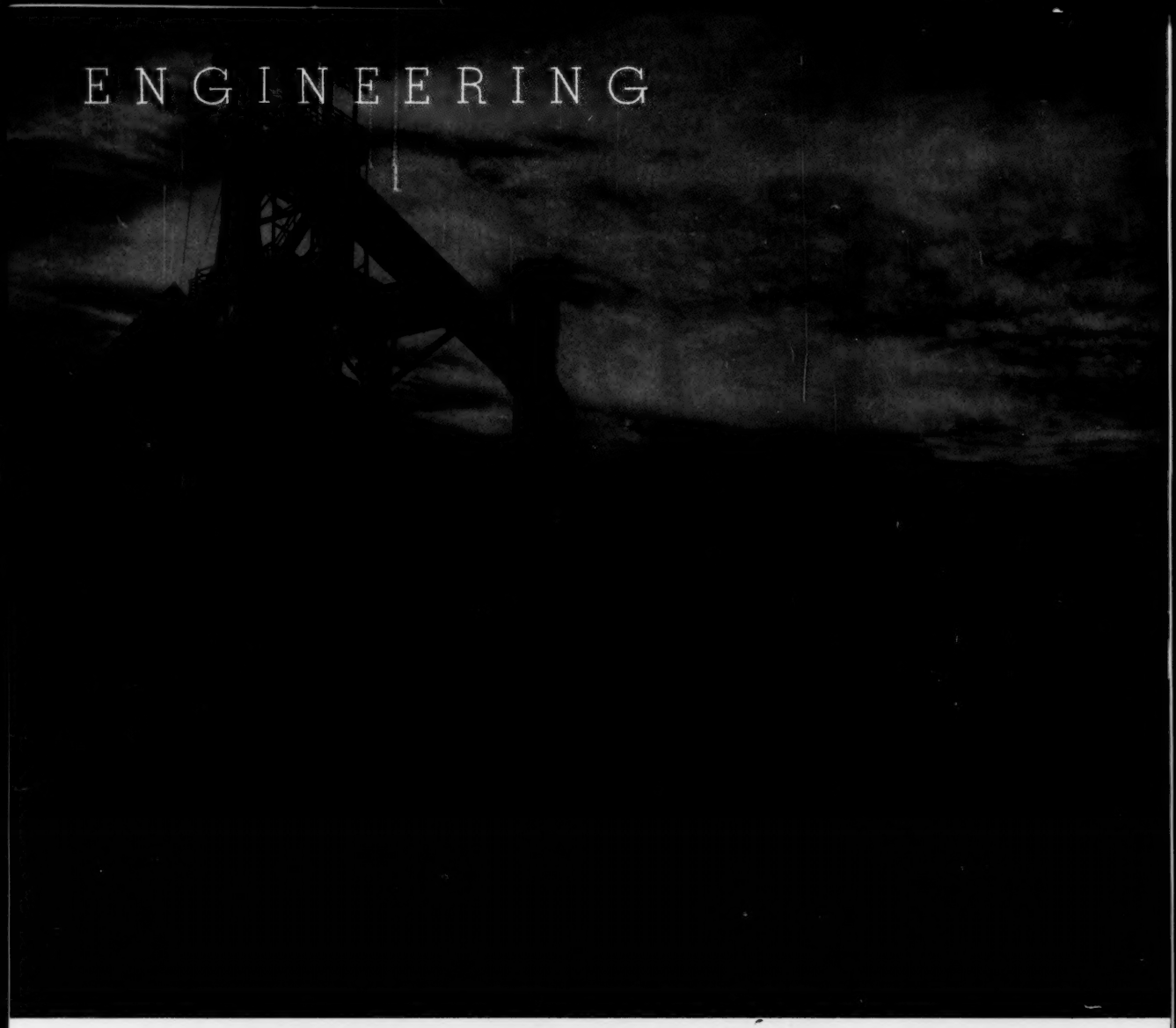




Imposing row of steel blast furnaces gives an indication of what may be in store for zinc, now that . . .

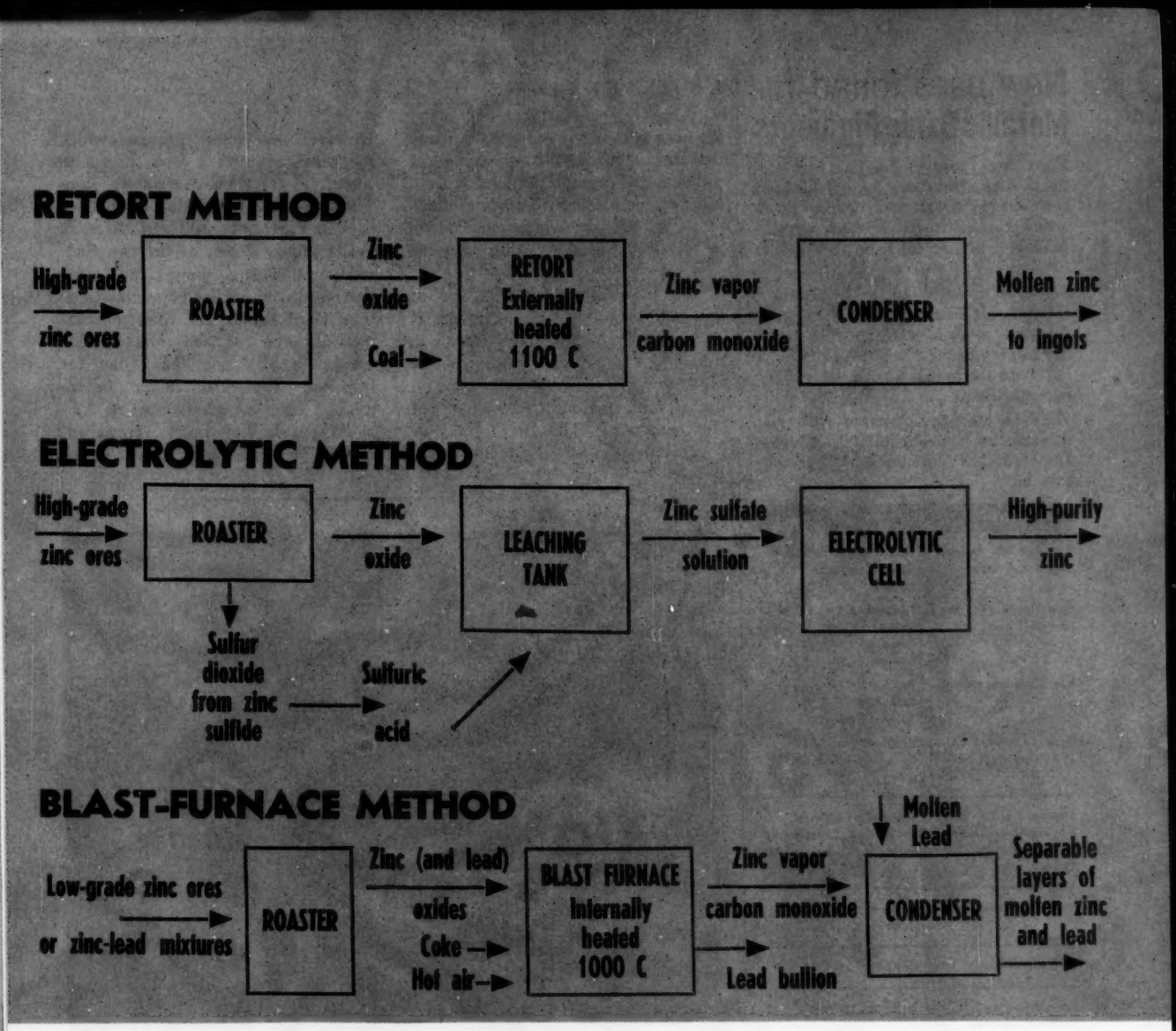
Blast-Furnace Process Looms Large on

At Avonmouth, England, the Imperial Smelting Corp. recently unveiled a pair of blast furnaces that have turned out some 70,000 tons of zinc from low-grade ores in two years of commercial operation (CW Technology Newsletter, Aug. 24). The novel process, a radical departure from conventional zinc recovery methods, caps 25 years of developmental work by Imperial. And though blast furnace techniques are well known in the ferrous metal industries, adapting them to zinc processing was an engineering feat of no mean proportions.

The current 10¢/lb. price for zinc (which is squeezing producers' profit margins) has sharpened interest in cost-reducing methods, may open the door to wider commercial use of the blast-furnace recovery process. American producers say they've been following Imperial's progress with the new technique, but are not considering it for domestic use—at least, not in the near future. However, one large U. S. producer reports that it has given some thought to the application of the blast-furnace route in one of its overseas facilities.

Three Common Routes: Mainstays of current zinc production are the retort, electrothermic and electrolytic processes. The first two—accounting for some two-thirds of the world's production—consist essentially of heating a zinc oxide-carbon fuel mixture in a closed vessel and condensing the zinc vapor formed. The difference is in the method of heating. In the retort process, heat is applied to the walls of the retort; the electrothermic furnace is heated by passing a current between carbon electrodes at the top and bottom of the furnace, utilizing the resistance of the charge to generate heat.

High-purity electrolytic zinc accounts for the remainder of zinc produced, is deposited from a zinc sulfate solution that is obtained by leaching



Horizon for Commercial Zinc Production

the zinc oxide with the sulfuric acid.

The product of the blast-furnace method is prime Western-grade zinc spelter. Needing refining for high-purity applications, this grade typically assays about 1.2% lead, 0.024% iron, 0.07% cadmium and 0.001% arsenic. It does have a large market, however, since it is suitable for galvanizing, zinc's biggest use. Retort zinc runs about 1% lead, too, while highest purity (and higher-priced product) is obtained by the electrolytic method.

Other uses for the metal include pigment-making, die-castings, rolled sheet, brass and other alloys and dry cells. Zinc dust is used as a reducing agent and in the manufacture of dyes and lithopone.

Economic Features: Two features particularly point up the potential economic advantages of the blast-furnace process: large capacity per unit and ease of handling low-grade and mixed ores. Although the present units have capacities of only 30 and 40 tons/day, respectively, the company says that optimum size is 100 tons a day. Retorts on the other hand, are restricted to a maximum unit size of about 10 tons/day by heating limitations. (Heat is applied externally to the retort, must pass through heavy refractory walls and still maintain a reaction temperature of 1100 C.)

The ability to handle low-grade ores makes the economics of the blast-furnace process look even better on two counts. First, ores of high iron content cause no difficulty, as they do in the other processes. Second, the method is flexible, can be used on mixed zinc-lead concentrates. Since zinc is released from the oxide at a temperature above its boiling point (907 C), it leaves the furnace in vapor form. The lead is tapped as molten bullion; silver and copper can also be separated out without too much difficulty.

One disadvantage of the blast-furnace process is the tendency of vola-

New uses found for **Metallic Oxide Pigments**

Today new product planners and production engineers are finding uses for the unique physical and chemical properties of metallic oxides which are surprisingly far afield from traditional usages.

Below is a review of their characteristics. Look them over. You may get the germ of an idea which will lead to the improvement of existing products . . . or to the reduction of new product manufacturing costs.

We'll be glad to cooperate with you in exploring the possibilities. Address Dept. 20, C. K. Williams & Co., Easton, Penna.

Name	Properties
Pure Red Iron Oxides and Kroma Reds	Fe_2O_3-98.5% SpG.-5.15 Color—Salmon to purplish red
Pure Yellow Iron Oxides	$Fe_2O_3.H_2O$-99% SpG-4.03 Color—Lemon to dark orange
Pure Black Iron Oxides	Fe_3O_4-96% min. SpG.-4.96 Color—Blue Black
Pure Chromium Oxides (and Hydrates)	Cr_2O_3-99% SpG.-5.20 Color—Light to dark green
Natural Oxides—Ochers, Umbers, Siennas, Metallic Browns, Red Oxides	Wide range of ferric oxide content and red, yellow and brown colors
Venetian Reds	Fe_2O_3-40% SpG.-3.45 Color—Light to med. red
Cuprous Oxide	Cu_2O-97% min.
Extenders—Barytes, Calcium Carbonate, Calcium Sulfate, Silica	Wide range

Characteristics

Composition: The basic colors of the iron and chromium oxides are determined by chemical composition. Reds are ferric oxide (Fe_2O_3); yellows, hydrated ferric oxide ($Fe_2O_3.H_2O$); blacks, ferro-ferric oxide (Fe_3O_4); and greens, chromic oxide (Cr_2O_3). All these compounds are chemically stable and light permanent.

Particle Shape: Physical properties such as oil absorption and suspension characteristics are dependent on particle shape, controlled by manufacturing processes.

Size: Color range is controlled by particle size—average size increases as color darkens. Uniformity of size determines brightness.

Purity: Freedom from impurities is essential for superior pigment properties and to prevent deleterious effects in end-products. Control of soluble salts, manganese and copper content are an important part of the Williams manufacturing operation.

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tile impurities in the ore to accompany the zinc vapor and contaminate the product. For example, zinc made from high-arsenic ores may contain as much as 0.05% arsenic, which must be removed by treatment with metallic sodium.

Another possible disadvantage of the coke-consuming blast furnace is fuel cost—a chief economic factor in weighing the different methods. The blast furnace requires about 0.9-1.0 ton of furnace-grade coke per ton of zinc produced. This fuel sells for roughly three times as much as coal. However, the retort process, which uses coal, requires a large excess to force the reaction, consumes considerably more than a ton of fuel for each ton of zinc produced. Relative availability and cost of the two fuels would therefore have substantial bearing on the choice of methods.

A Hard Road: The road to commercialization of the blast-furnace process was a long, hard one for Imperial. The first major breakthrough came when attempts to fight zinc's low boiling point were abandoned. The relatively high cost of

WIDE WORLD

Towering Controls for Nuclear Power

From high atop a full-scale mockup of a pressurized-water reactor, an engineer sights down along a bank of power tubes through which control rods are moved to regulate the fission process. The towering array is symbolic of the fast-growing nuclear equipment industry and the demand it has created for new materials of construction. In the Shippingport PWR, for example, 24 such tubes will be used to insert rods of neutron-absorbing hafnium into the reactor core.

The job of producing commercial quantities of exotic metals and engineering them into critical nuclear assemblies presents a challenging opportunity both to chemical producers and to equipment fabricators.

QUIZ

For Multiwall Bag Buyers

"How Does Your Packaging Operation Rate?"

1 Is your bag correctly sized for your product?
2 Is your bag properly constructed for your product?
3 If loss of product is caused by deterioration, would special protective sheets help to reduce such loss?
4 Is the total cost of your bag out of proportion to the selling price of your product?
5 Does your product cost warrant redesigning your bag to merchandise your product more effectively?
6 Are you using the most economical filling machine available for packaging?
7 Are your current suppliers giving you the service you desire?
8 Are your suppliers integrated and capable of maintaining dependable service at all times, under all conditions?
9 Are your suppliers' representatives qualified to help you with your packaging, sales promotion and marketing?

Perhaps we may be able to help you to arrive at the right answers in order to achieve higher production at lower costs.

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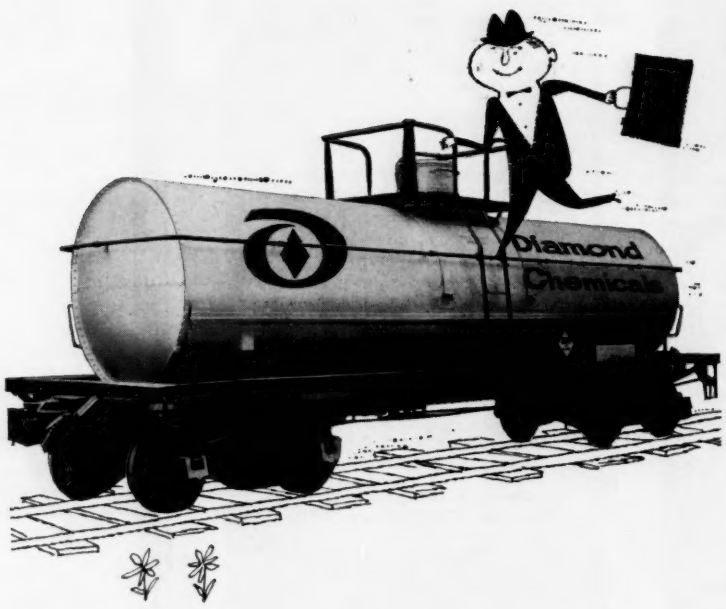

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coke discouraged the use of excess fuel to keep down the concentration of carbon dioxide, which tends to re-oxidize the zinc vapor. And condensing the vapor in the furnace (to permit tapping the molten metal as in normal blast-furnace operation) also resulted in reoxidation. Imperial's solution: a novel heating and recovery system that prevents oxidation, simplifies condensation of the vaporized metal.

Actually, reoxidation can occur any place where zinc vapor comes in contact with carbon dioxide at too low a temperature. The answer, then, is to keep the temperature high throughout the furnace and in the passage to the condenser. The latter is electrically heated and filled with coke to keep the zinc in the reduced state. The charge is kept hot by preheating the coke and the zinc concentrate and by using a hot air blast at the top of the furnace in addition to the conventional one at the bottom.

But the key step in avoiding re-oxidation is the recovery system used in the condenser. Imperial discovered that a stream of molten lead would scrub the zinc vapor from the gaseous mixture coming from the furnace without requiring a lower temperature. Thus, the zinc is removed from the oxidizing medium and can be cooled, without danger of oxidation, to the point at which it separates from the lead. The zinc top layer can then be decanted and run directly into ingot molds.

An additional advantage gained by this condensation trick is control of dust formation. In the retort method, as much as 20-25% of the zinc condenses directly to solid form as tiny particles of zinc dust. There is a limited market for this product, but for most applications, oxidation of the large surface area reduces the zinc content appreciably (on a percentage basis), makes the dust difficult to fuse. By trapping the zinc in vapor form and cooling it in liquid suspension, Imperial's condensation system avoids dust formation.

Although U.S. producers say they're satisfied with present methods now, chances are they'll take a closer look at the blast furnace if conditions change. A swing back to easier money and increased capacity could be just the opportunity that blast-furnace zinc has been waiting for.

PROCESSES

Steel Purification: A method to insure that titanium-bearing stainless steels will be free from stringer type inclusions of nonmetallic substances has been developed by Eastern Stainless Steel Corp. (Baltimore) in cooperation with Linde Air Products Co. Before pouring the molten steel from the induction furnace in which it is made, a measured amount of a special high-temperature liquid slag is poured into the mold at 3000 F. The steel is then poured (not ladled) into the mold, where it is "slag washed" as it passes through the molten slag. Beneficial effects of the step are said to include cleansing the melt of most of the impurities present, protecting the melt from air oxidation while solidifying, and slowing the rate of solidification to allow remaining impurity traces to rise to the top of the melt and pass into the slag. The new process is said to reduce scrap.

•

Plastic Reinforcement: Use of asbestos as a reinforcing agent in polyester plastic molding compounds is now possible, according to World Commerce Corp., S.A. The company's Amveco asbestos fiber—in the ⅜-in. form —is said to be less expensive than glass fiber and more resistant to heat and moisture than sisal, the other major reinforcing agent.

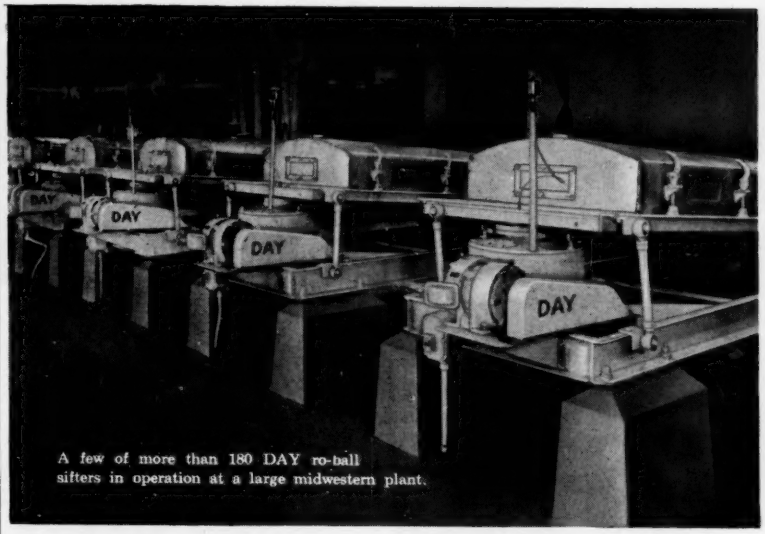
•

Nylon Cord: A new unit recently installed by Firestone Tire & Rubber Co. at its Akron plant features some new processing tricks in the production of nylon tire cord. Main point of the operation is to impregnate the cord with a "gum-dipping" solution of liquid rubber and chemicals. This solution gives greater adhesion between plies of the cord and between the cord and the tread. Essential to the process is lowering of nylon's high resiliency. This is accomplished by subjecting the cord to tension of 30,000 lbs. and 450 F temperature during the gum-dipping operation.

•

Rocket Fuel: A process for producing cheaper unsymmetrical dimethyl hydrazine has been developed at the University of Florida as part of a project sponsored by Davison Chemical Co. Starting with salt, air and natural gas, the Florida chemists say, the fuel can be made to sell for $30/gal.

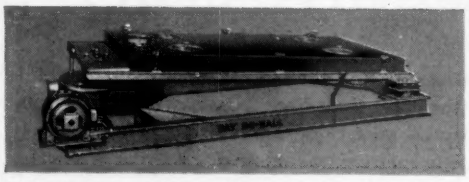
SIFT finer-faster-cleaner with DAY ro-balls



A few of more than 180 DAY ro-ball sifters in operation at a large midwestern plant.

Today thousands of products wet or dry, from flour to wood chips, are sifted through efficient, low-cost, high-production DAY ro-ball sifters. Superbly engineered, built for trouble-free operation under the severest service conditions, they insure longer life with lower maintenance costs.

The exclusive super active ball cleaning device provides rebound points in each ball compartment, assuring fast, thorough sifting of your product. Gyrating action brings material into constant contact with every square inch of screen surface. A stabilizer maintains screen in horizontal position and insures smooth operation.


DAY standard ro-ball, available in six sizes, single or multiple screens. Single screen models in stock.

Stainless steel units available to meet food and dairy sanitary codes.

Many models are available so it is easy to choose one which will exactly suit your requirements. They can be used separately or in combination with DAY mixers or blenders to save product handling. A completely equipped lab is available for testing your product.

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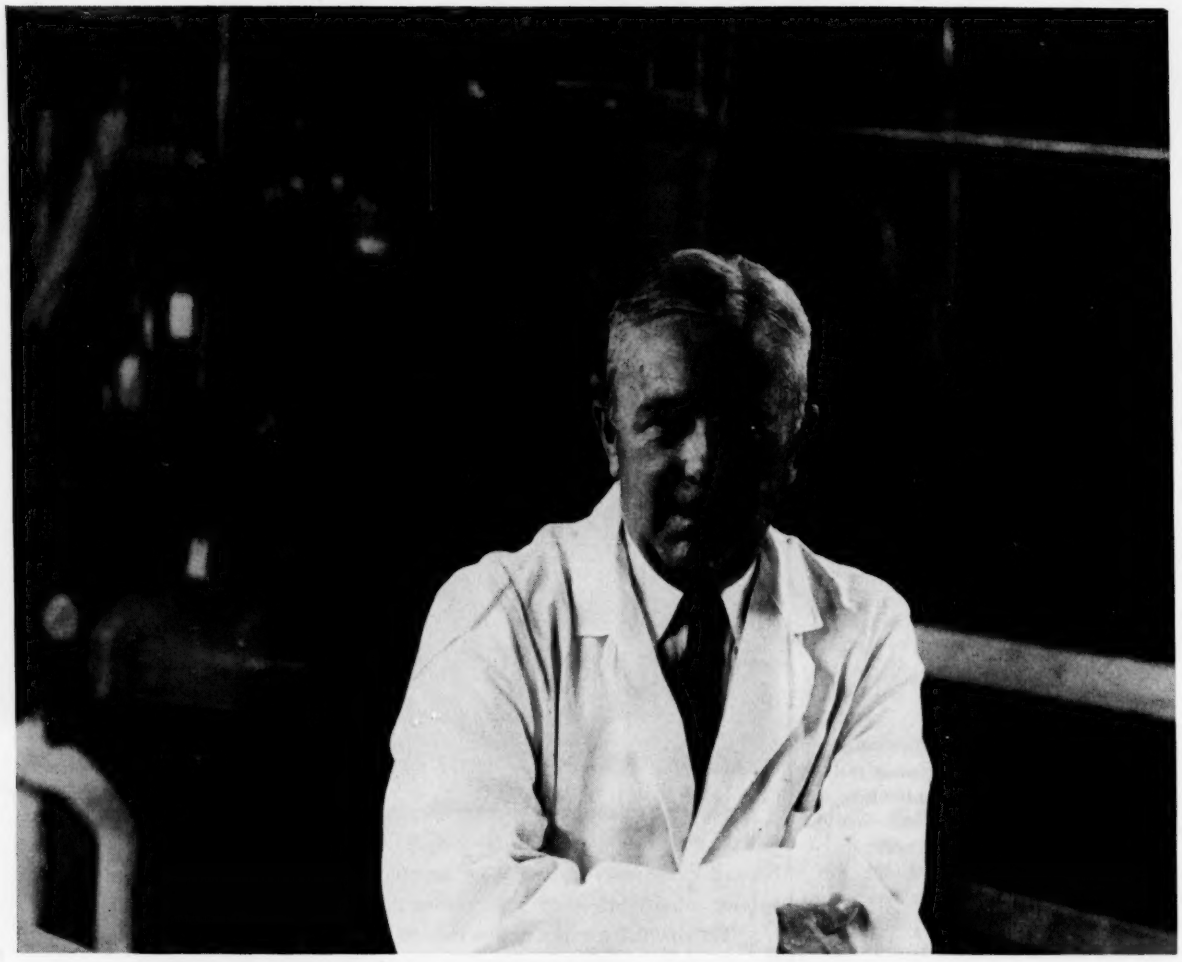

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Washington Newsletter

CHEMICAL WEEK
September 14, 1957

The battle of the budget is warming up again. The President and Congressional leaders keep the pot boiling by coming up with sharply varying figures on the extent of actual savings resulting from Democrat-led efforts in the Congressional session just ended to slash Eisenhower's budget requests for 1958. You can look for more debate as both parties vie for credit as guardians of the voters' pocketbook.

But now, the battle is shifting ground from appropriations to the actual rate of spending, as Treasury Secy. Robert B. Anderson and Budget Bureau Director Percival Brundage seek to hold down spending—in some cases to below levels approved by Congress. This is putting them in direct line of fire from federal department heads, and from business and other groups benefiting from federal spending. They're all protesting vigorously the Budget Bureau's refusal to release the full amount of appropriated funds.

Democrats are exploiting this interagency feuding by drawing out complaints of agency heads in public hearings. Already out into the open are charges that the Budget Bureau is modifying spending rates voted by Congress for expanded food and drug law enforcement, research on cancer and other diseases, control of air and water pollution, testing of flu and polio vaccines.

The complaints go deeper—affecting even programs where spending boosts weren't voted by Congress. Department heads complain that Brundage is releasing funds only piecemeal, okaying so far only the spending for the July-September quarter. Budget officials, they charge, are keeping agencies in the dark on the amounts to be released for the remainder of the year. As a result, many agencies can't program spending for a full year—even though Congress appropriated the funds on that basis.

The upshot of the Budget Bureau's policy—uncertainty as to whether federal agencies will be able to spend at rates sanctioned by Congress. In some cases, agencies have already been forced to cancel tentative commitments. New and expanded research programs are being postponed. Agencies have been forced to hold off on hiring—missing, in some cases, the chance to land certain hard-to-get research scientists.

Budget officials cut Food & Drug Administration and National Institutes of Health spending up to 10% in allotting money for the July-September quarter. But protests by Health-Education-Welfare Secy. Marion Folsom led to a restoration of most of the NIH funds and one-third of the cut in FDA's money.

Folsom is still trying to get the full year's appropriations released now. His argument: the uncertainties resulting from quarter-by-quarter spending authorizations make it impossible to fill new staff posi-

Washington Newsletter

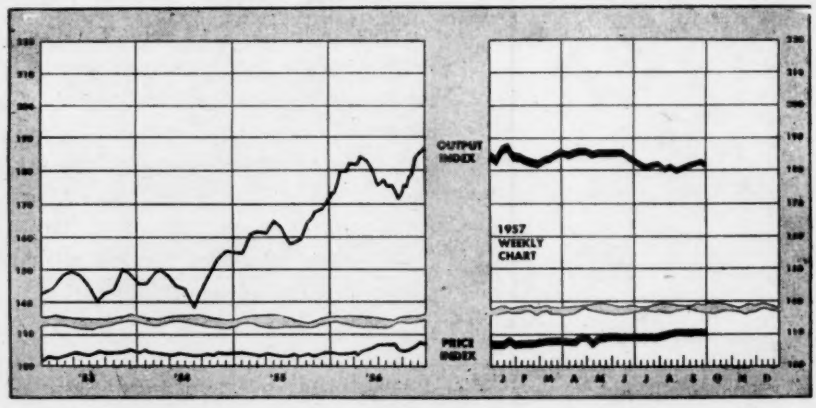
(Continued)

tions. He points out that even though most of the initial cut in FDA funds was rescinded, the agency still had to tell 40 technical specialists it had agreed to hire that it could not hire them.

Brundage is resisting pressure to lift tight spending controls despite warnings from department chiefs that present uncertainties as to spending levels have impaired some programs and threaten to undermine others. Meanwhile, Democrats see plenty of chances to make hay with the voters as they spotlight trouble in those programs that have strong public support—such as medical research. Some top officials are frankly worried that pent-up frustrations over Budget Bureau policy will break out in a first-class explosion when Congress gets the full story next January.

Business firms with foreign patent dealings may have to follow State Dept. policy guides. The idea of bringing patent owners and licensees under State Dept. control is now being talked up. It may turn up as the subject of hearings by the Senate Patent Subcommittee next year.

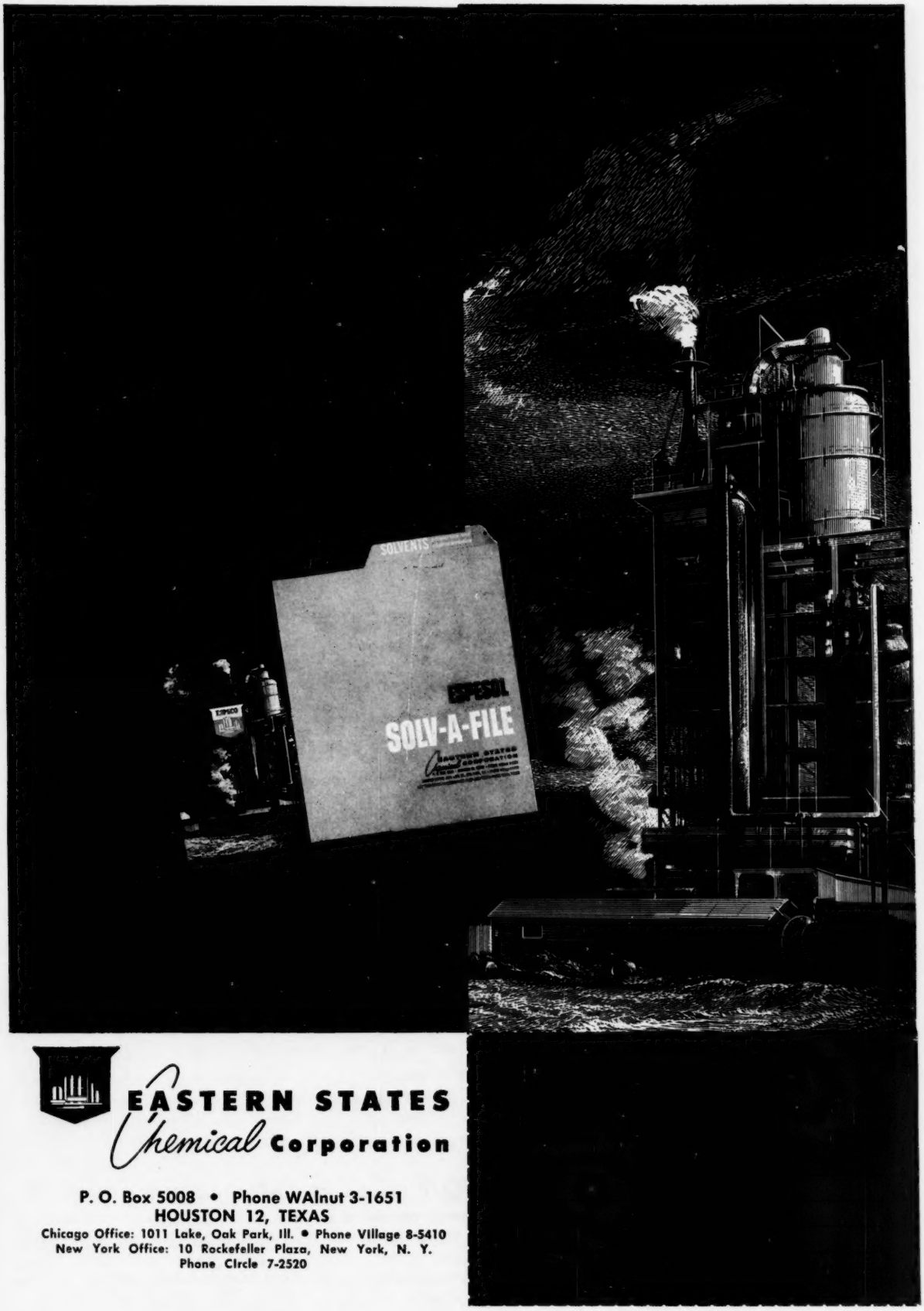
A report by an ex-State Dept. aide, prepared for O'Mahoney's use and recently released, warns that U.S. efforts to woo underdeveloped countries may be torpedoed unless we extend patent aid to help them establish new industries. The report says the practice of using patents to carve up world markets is on the rise. The report, "The International Patent System and Foreign Policy," by Raymond Vernon, is available for 20¢ from the Government Printing Office, Washington 25, D.C.



Business Indicators

WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100)	182.5	182.0	172.1
Chemical Week wholesale price index (1947=100)	110.9	110.9	105.5
Stock price index of 11 chemical companies (Standard & Poor's Corp.)	42.80	42.53	48.47

MONTHLY	Exports			Imports		
Foreign Trade (million dollars)	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
Chemicals, total	112.5	134.1	114.5	21.4	24.7	18.9
Coal-tar products	6.1	10.2	8.1	5.0	4.8	4.1
Industrial chemicals	15.9	21.7	16.5	6.9	7.6	7.1



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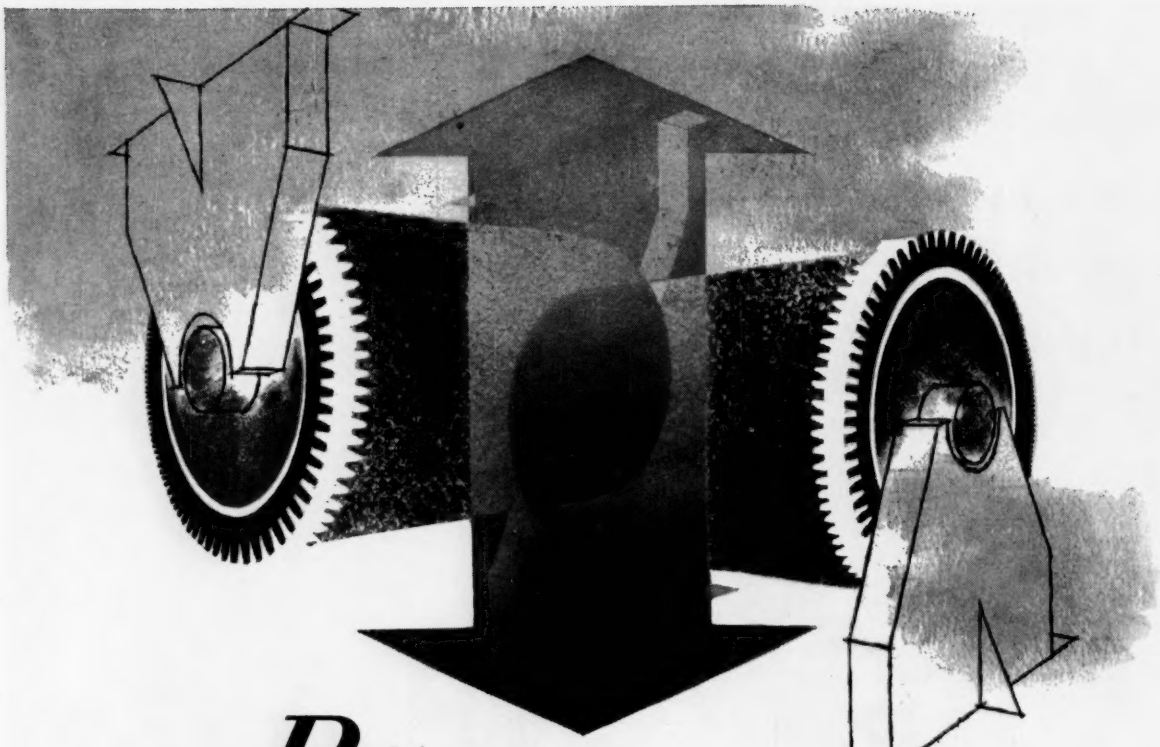

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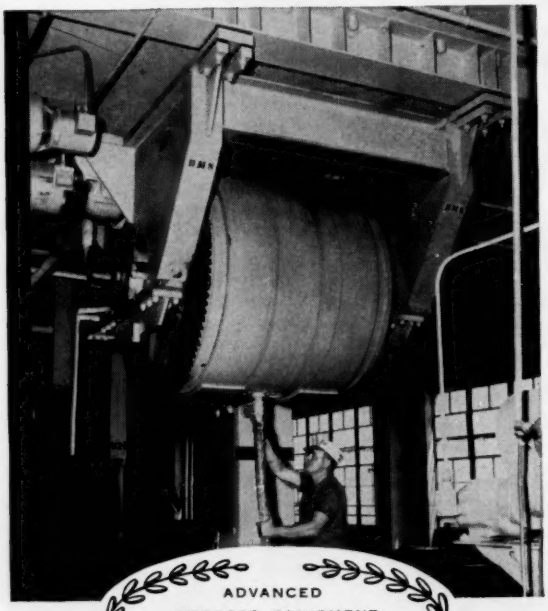

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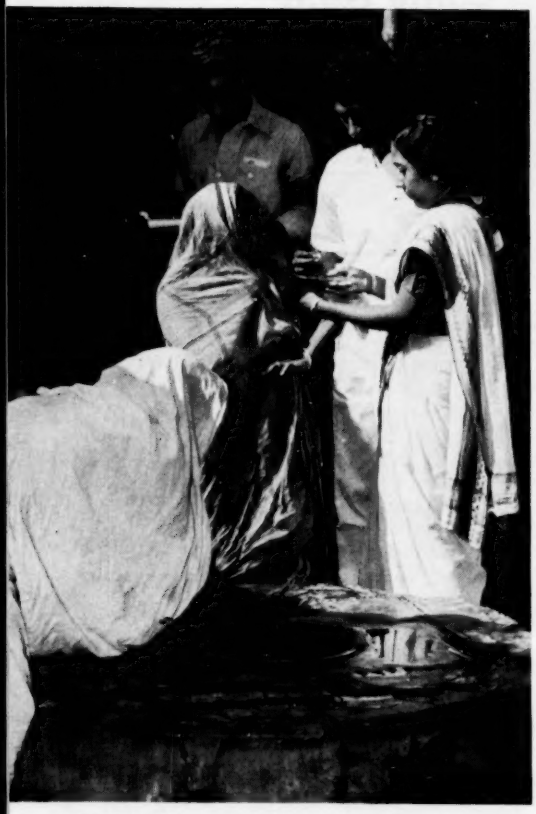


U.S. Chemical Exports to India

(Source: U.S. Dept. of Commerce)

Commodity Subgroup	Value in million dollars		
	1955	'56	'57 (1st 5 mos.)
Medicinals and pharmaceutical products	6.2	7.2	3.5
Chemical specialties	6.4	8.4	5.3
Industrial chemicals	1.3	1.1	0.4
Coal-tar products	1.3	1.1	0.6
Pigments, paints and varnishes	1.2	1.3	0.6
Fertilizers and fertilizer materials	0.6	6.0	2.1
Soap and toilet preparations	0.008	0.02	—

Medicinals, specialties top list of exports to India, whose trade deficit problems may bring . . .

New Climate for U.S. Chemical Investments

U.S. companies with interests in the vast, long-range potential of chemical business in India can expect no change in that country's import policies once the current, self-imposed ban on imports is over.

This was the consensus of observers last week as India entered the third and final month of the ban, imposed to strengthen India's deteriorating balance of trade position, in which its deficit rose from $136.5 million in 1955 to $422 million in '56.

Temporary Answer: But despite the fact that the current ban is holding the line on the increasing deficit, the government of Prime Minister Jawaharlal Nehru realizes that an import ban can be at best only a temporary answer, that the long-range solution lies in increasing India's industrial self-sufficiency.

Toward that end, the government has called for a spectacular 300% rise in chemical production during the second five-year plan, 1956-'61. This is the highest percentage increase demand of any industry in the country, except steel. The aim of the plan is to make India self-sufficient, if possible, in such important chemicals as fertilizers, sulfuric acid and soda ash. At present, India buys abroad about $40 million worth of chemicals yearly (*see table, above*).

Foreign Investments: Nehru reportedly also recognizes the need for foreign investments—both direct and portfolio—in his country's efforts to boost its industrial capacity. To encourage foreign investments, there has been partial relaxation of the tight restrictions on foreign participation in Indian industry. And U.S. chemical firms—along with industry in general—have been taking advantage of the opportunity to increase their capital participation in that country.

Total U.S. investments in India as of May of this year were estimated at $100 million, and Indian officials have expressed the hope that the figure will top $200 million by year's end.

U.S. Firms Active: A number of U.S. chemical companies are now operating, or are planning to begin operations, in India. They include Union Carbide, which makes organic solvents, polyethylene and ethylene dichloride; American Cyanamid's Calco Division, specializing in azo dyes; Hilton-Davis Division of Sterling Drug, making naphthols and fast color base; Parke, Davis & Co., producing chloramphenicol; Lederle Division of American Cyanamid, making pharmaceuticals; Monsanto, acting only as an importer at present; and Dow, making polystyrene. In addition,

Where Import Ban Could Come Next

Countries with unfavorable balance of trade.	Imports-over-exports differences in millions of U.S. dollars. (Source: United Nations Dept. of Economic & Social Affairs)			
	Total trade deficits		Deficits in chemical trade with U.S.	
Nations	1955	'56	1955	'56
Canada	$ 365.1	$ 858.4	$ 91.8	$ 94.7
United Kingdom	2,745.8	2,008.0	51.5	37.3
Austria	188.4	124.7	0.8	1.6
Netherlands	520.5	850.3	10.5	11.1
Italy	848.0	1,011.4	19.5	22.3
Japan	466.0	732.3	35.3	66.8

Merck-Sharp & Dohme and Pfizer are looking at the possibilities of setting up a proposed streptomycin unit in partnership with government-owned Hindustan Antibiotics.

These companies, and others, generally describe India as a "calculated business risk" for the next five years. A year ago, this country of 377 million was considered the best commercial risk in the Far East. The often-heard comment is, "The Nehru government honors its commitments, but what if another government came in?"

Ban Strictly Imposed: New Delhi rigorously enforces the import ban now in effect. No new licenses have been issued to established importers, although they have been allowed to use their unutilized quotas for the previous quarter, and to convert a license for one item to cover another —provided the new item is considered essential for industrial development.

Thus far, the ban has adversely affected only retail trade in consumer goods. Manufacturers report that production has been unaffected, because the government has authorized licensing authorities to issue special licenses for industrial raw materials.

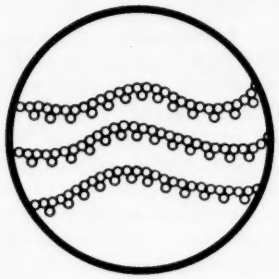
Further relaxation is expected after September for chemical makers. These firms must import between 60% and 80% of their raw materials, and despite the fact that special efforts have been made to avoid interrupting the flow of raw materials, chemical stocks are running low. But further relaxation of restrictions may not be enough, some businessmen are saying, since India's foreign exchange position isn't expected to improve appreciably for another year or two at least.

Despite inconveniences, however, both Indian and foreign chemical company spokesmen acknowledge that New Delhi's planning has enabled the industry to push ahead during the past seven years. For example, Atul Products Ltd., a major dye maker, increased its gross profits from $432,810 in 1955 to $649,950 in '56.

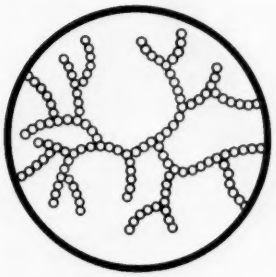
High protective tariffs and controlled competition are also given credit for chemical industry growth. Duties have been as high as 40% on soda ash, 37% on caustic soda and 26% on dyes. "We avoid a monopoly," a government official told *CW*, "and we make certain every undertaking finds a market for its goods."

Other Areas to Watch: In addition to India, there are other countries *(see table, above)* that U.S. chemical executives should watch for possible changes in import regulations and foreign investment policies. These are countries with trade deficits, which, when also faced with a disadvantageous foreign exchange position—a dollar shortage in particular—may be forced to drastically restrict imports. After restricting imports, such a country could be expected to turn to new methods of attracting foreign investment capital as a means of gaining a more nearly self-sufficient economy and reversing the balance of trade. Thus, as export opportunities for U.S. chemical firms slacken, investment opportunities will probably expand. Expanded investment opportunities and, as is often the case, the opportunity to produce on-the-spot take on even greater significance in light of the growing common market concept.

WHAT CAN YOU DO WITH THESE 3 NEW COLLOIDS?



GUAR GUM



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RAMALIN is readily dispersible and cold water soluble

RAMALIN has low viscosity at high concentrations

RAMALIN forms fluid stable solutions

RAMALIN is more reactive

RAMALIN, when combined with resins, forms water-resistant films and coatings

RAMALIN has a greater affinity to many fibers and other materials

RAMALIN has indications of superior flocculating properties

RAMALIN is a pure food material

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SUPERLOSE is a giant molecule with a molecular weight of 150,000

SUPERLOSE has outstanding film strength and is suitable for film and fiber manufacture

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SUPERLOSE can be supplied as a dry powder or stabilized solution

SUPERLOSE is a pure food material

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ADMINISTRATION

IDEAS

Too Conscientious: That company executives are too conscientious about their corporate duties for their own and their companies' good is suggested in a new American Management Assn. survey on executive vacation practices. Forty-six of 96 top-management men in various industries reported that they used less than their full amount of vacation time last year. This includes four executives who took no vacation at all. Fourteen executives said they were required by their firms to take at least some time off each year; in six cases, a minimum limit was specified. Twenty-four others said their companies "encouraged" them to take their vacations.

•

Semantics in Business: Smith, Kline & French Laboratories (Philadelphia) now has an "International Division"; its one-time "Foreign Division" is no more. The change in names, says Vice-President F. M. Rivinus, Jr., was made because the word "foreign" has come to mean something strange or unfamiliar. It's entirely a semantic point, he observes, but says that "in view of the energies being expended on international understanding, we feel it may be an important point."

•

Isotopes and Profit Sharing: Two management-level conventions coming up in November are the 10th annual profit-sharing conference (Nov. 14-15) in New York's Hotel Commodore and a National Industrial Conference Board course on industrial uses of radioisotopes (Nov. 18-21) at the Westchester Country Club in Rye, N. Y. For the first-named meeting, the Council of Profit Sharing Industries is arranging panel sessions so that executives can hear reports from and ask questions of managers from their own business and industrial categories. The conference board bills its program as "a nontechnical course designed especially for management, to acquaint executives with the opportunities that exist for their companies in the field of radioisotopes and applied radiation."

•

Spreading Out in Gotham: Aside from its present lofty suites in New York's towering RCA Building, American Cyanamid Co. is planning to

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Your chemical, paint and petroleum products travel with greater safety in Continental's exclusive Perma-Lined steel containers. That's because specially-formulated Perma-Lining enamels are airless hot-sprayed and baked right in the formed container. Every last inch of inside surface—even side and bottom seams—gets complete uniform coverage.

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BAKER PROCESSING CHEMICALS...

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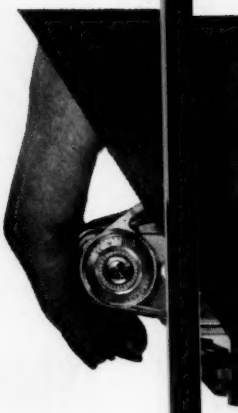


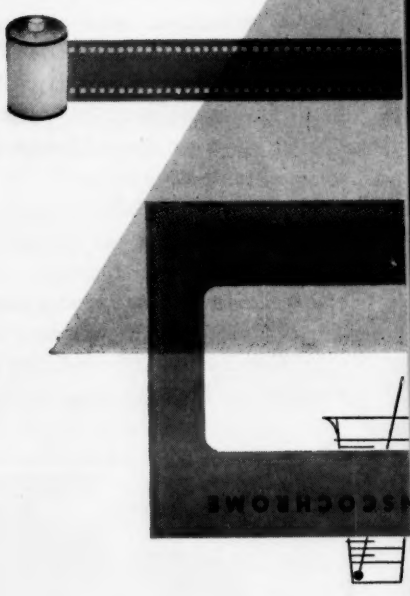
THE PHENOMENAL GROWTH OF PHOTOGRAPHY as a hobby in recent years is due – in large measure – to the development of high speed color films such as Anscochrome. And the success of this and other fine Ansco films is due—in turn—to the meticulous care with which they are made. As Ansco puts it, "Ours is an industry of precision."

For many years, J. T. Baker has supplied industry with precision chemicals in tonnage quantities. As Ansco says in their letter opposite, *"In the manufacture of Ansco photographic film emulsion, the high purity of the ingredient chemicals is very important. The work your company has done to reduce metallic impurities to a minimum is particularly important. Your blending of dry chemicals to insure uniformity within the lot is extremely helpful."*

Your processing techniques may, of course, be vastly different from those employed by Ansco – but the principle behind the choice of Baker high purity tonnage chemicals remains the same. Would you, for example, like to simplify your process? Improve your product? Eliminate one or more purification steps?

Baker *Purity by the Ton* may help provide the solution, just as Baker experience, personnel and plant make this purity possible at competitive prices. Perhaps we can manufacture the chemicals you need to exacting specification.

Our pride in our trademark is reflected in the quality of our product. Needless to say, we will always consider your trademark as precious as our own.



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Ansco

ANSCO

A Division of General Aniline & Film Corporation

BINGHAMTON, NEW YORK

September [illegible], 1957

Mr. Warren F. Schumacher, Sales Manager
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J. T. Baker Chemical Company.
Phillipsburg, New Jersey

Dear Mr. Schumacher:

We have been purchasing Baker chemicals for production use for a great many years.

As you know, in the manufacture of Ansco photographic film emulsion the high purity of the ingredient chemicals is very important—there are several impurities that can be quite critical in any of our raw materials. Ours is an industry of precision.

The work that your company has done to reduce metallic impurities to a minimum is particularly important. Since we pre-test each batch of any chemical raw material by actually making film with it, your blending of dry chemicals to insure uniformity within the lot is extremely helpful to us.

Over the years we have enjoyed a very fine relationship with your company. We have appreciated your advance planning in carrying ample stocks of the chemicals that are important to us. You have been particularly effective in making special chemicals for us for certain of our specialty products.

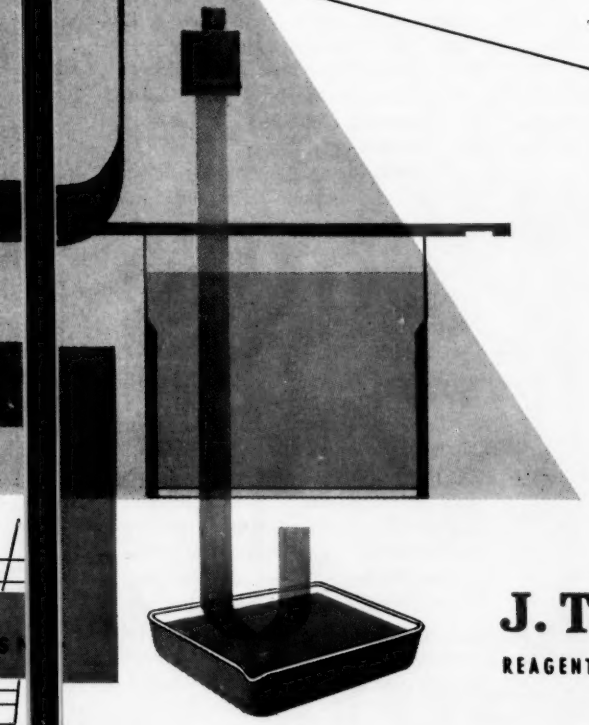
Ours is a growing industry, and as Ansco continues to expand we will continue to count on suppliers such as you.

Sincerely yours

A. T. Morphy

A. T. Morphy
Purchasing Agent

PHOTOGRAPHIC MATERIALS AND EQUIPMENT SINCE 1842



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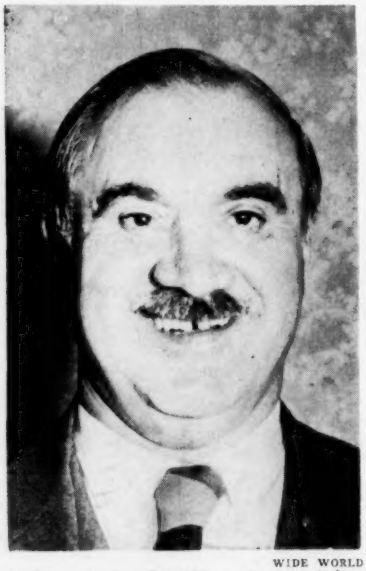
expand its headquarters into two new buildings now under construction in Manhattan. Earlier, it was announced that Cyanamid will probably be a principal tenant in the Time-Life Building that will rise only a block away from the RCA Building. Now Cyanamid says its Fibers Division staff—including sales, merchandising, advertising, technical services and accounting facilities—will be located on the 16th floor of a 34-story air-conditioned office building under construction in the garment and textile district, about one mile downtown from the RCA Building. Seven other major textile makers previously closed leases on space in the new building, at Avenue of the Americas and West 40th Street.

LEGAL

Plastic Patent Upheld: A patent on a process for making plastic strips for use in clothing or other articles subject to repeated flexing has been upheld by the U.S. court of appeals at Philadelphia. Anchor Plastics Co. (Long Island City, N. Y.) is exclusive licensee of the patent (No. 2,531,234). Defendants were Stay-Rite Supply Co. (Newark) and Keystone Plastics (Union, N.J.)

In the lower court, Federal Judge Alfred Modarelli at Newark had ruled the patent invalid on the ground that the principle involved had been covered by earlier patents. But the appellate court set aside Modarelli's ruling on Anchor Plastics' appeal, calling the patent a "worthwhile, valid invention." Defendants' appeal of this ruling was denied.



WIDE WORLD

Judge Modarelli: His patent validity decision is twice overruled.

•

Hydrogen Sulfide Damage Suit: Thirty Pittsburgh men have filed damage suits totaling $305,000 against Barium Reduction Co. (South Charleston, W. Va.), charging negligence. The men say that serious injury to their throats, windpipes and respiratory tracts resulted from inhaling of hydrogen sulfide that allegedly escaped from defective tanks shipped by Barium. The men assert that the poisonous chemical escaped from tanks on a truck parked near their place of employment in Aug. '56.

Barium is charged by the plaintiffs with being negligent in not properly inspecting the tanks before filling them.

•

Coal-Tar Color Definition: The U.S. Food & Drug Administration has decided to delay amending the definition of the term "coal-tar color" as it appears in paragraph 9.1 (a) of the regulations for color certification pending a public hearing. Date of the hearing—for the purpose of receiving evidence relevant to objections raised to the proposed definition change—has not yet been set.

Objections to the change—received by FDA during the 30-day period following the appearance of the proposed change in the *Federal Register*—were received from firms asserting that the change would adversely affect them.

LABOR

Civic Responsibility: The White House reply to Walter Reuther's bid for Presidential support in his tiff with the auto companies is one possible management guidepost in bargaining on new wage agreements. The White House letter—written for President Eisenhower by economic advisor Gabriel Hauge—calls for both unions and management to display "a sense of civic responsibility" in such negotiations.

The letter makes clear that Eisenhower still feels the federal government should keep out of private col-

No Excessive Heating

New Rectifier Cooling System Prevents Heat Build-up and Damage

when ac Power Fails

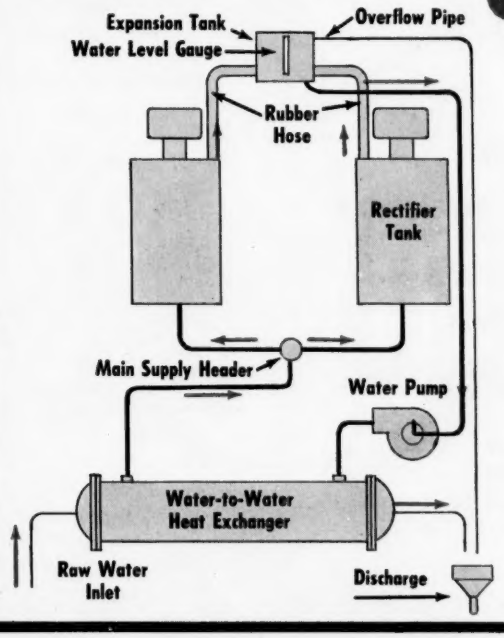
A SAFER, more effective cooling system in the Allis-Chalmers rectifier continues to circulate water *even when an ac power failure stops the water pump.* Heat and steam are dissipated before they can develop to the danger point.

The new system features an expansion tank that extends the full length of the rectifier frame with short vertical connections from each tube. With warm water continuing to flow freely upward, a thermo-siphoning action draws cooler water into the tubes. Build-up of excessive temperatures is prevented. Steam pockets are kept from forming. Subsequent water loss from the recirculating cooling system is minimized.

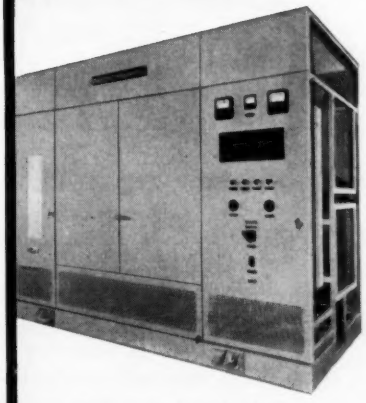
Successful operation in hundreds of installations is your assurance of the complete reliability of Allis-Chalmers mercury arc rectifiers. Contact your nearby A-C office or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wis.

How the System Works

Water is normally pumped through the water-to-water heat exchanger to the main supply header from where it circulates through rectifier tubes picking up heat. Hot water flows up through the short connections to expansion tank and back down to suction side of water pump.



ALLIS-CHALMERS
Mercury Arc Rectifiers



Factory-packaged units cut installation time and costs. Sealed tube rectifiers are supplied in completely enclosed or open types. Here is a typical, completely enclosed, 1000-kw, 250-volt rectifier for steel mill service.

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A-5425

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IF IT'S A

Borden Chemical

IT'S GOT TO BE GOOD!

lective bargaining. But Hauge says the President recognizes that the public has an interest in the agreements arrived at, hopes that unions and management will conduct their negotiations "with a keen awareness" of this.

•

12¢ Pay Hikes: So far, there is no pat formula to determine just how much any given wage increase may contribute to the present inflationary trend. In the process industries, recent settlements have involved pay hikes somewhat larger than those granted under the pattern prevailing during the first half of this year. Three of the latest agreements call for wage boosts in the neighborhood of 12¢/hour:

• At Buffalo, N. Y., members of the United Steel Workers (AFL-CIO) ended their 19-day strike against Electro Refractory & Abrasive Corp., accepted a 12¢/hour rise in base pay and 6½¢/hour in additional fringe benefits.

• At Louisville, Ky., a 28-month contract between Stauffer Chemical Co. and International Chemical Workers Union (AFL-CIO) calls for wage increases ranging from 12 to 15¢/hour, retroactive to July 19; additional increases of 6 to 7¢/hour, effective Nov. 19; and further increases of 8 to 10¢ per hour in Nov. '58.

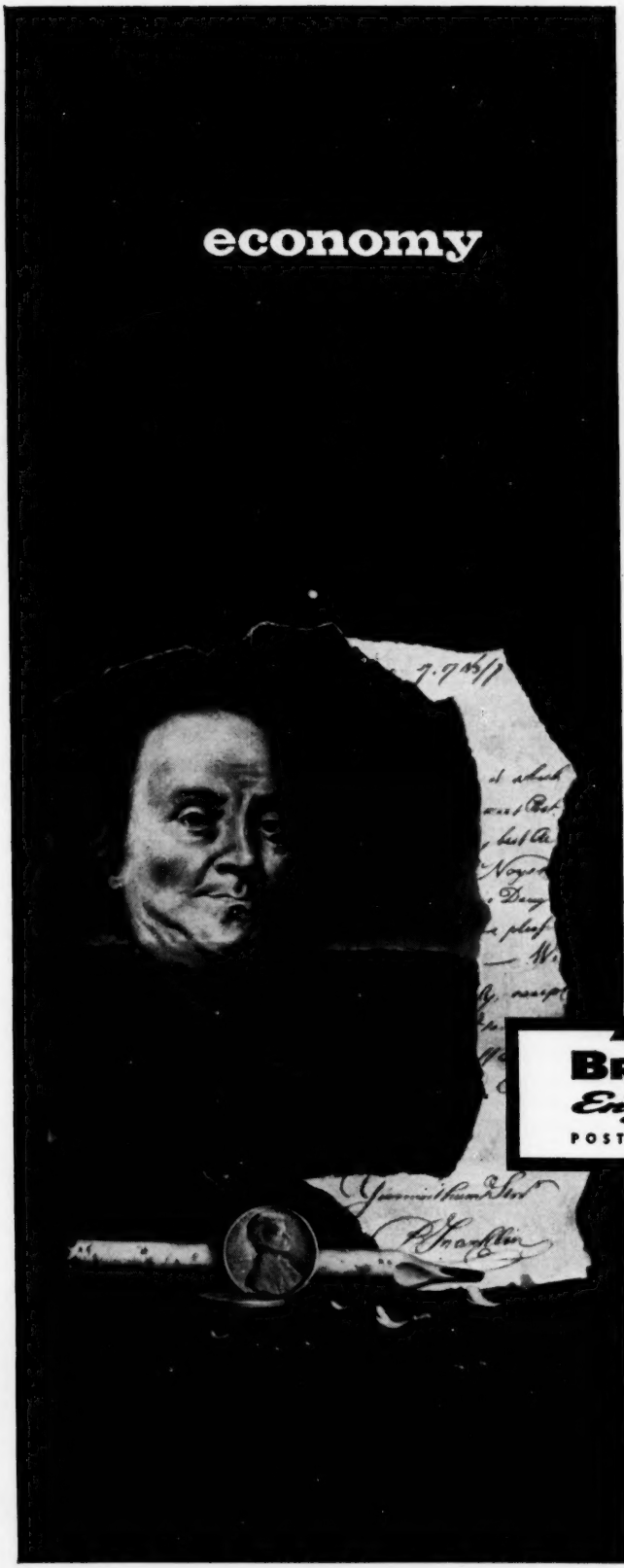
• At Albuquerque, N. M., Sandia Corp.—a prime contractor for the Atomic Energy Commission—has concluded two-year contracts with the Metal Trades Council and the Office Workers, both AFL-CIO, and the International Plant Guards Union (independent), following a 17-day strike. Terms—including wage increases averaging 11½¢/hour—were based on recommendations of the Atomic Energy Labor Management Relations Panel.

•

• At Baton Rouge, La., members of District 50, United Mine Workers, ended their 44-day strike at the Ethyl Corp. plant. Workers had voted 956 to 838 to reject the company's "final offer" and continue their strike, later voted 768 to 483 to accept those terms.

Strikes, Old and New: Elsewhere, the industry continues to be plagued with an unusual number of strikes.

At Toronto, Ont., a dynamite-and-alarm-clock bomb (lacking a detonator) was delivered to the production manager of the Lever Brothers plant that



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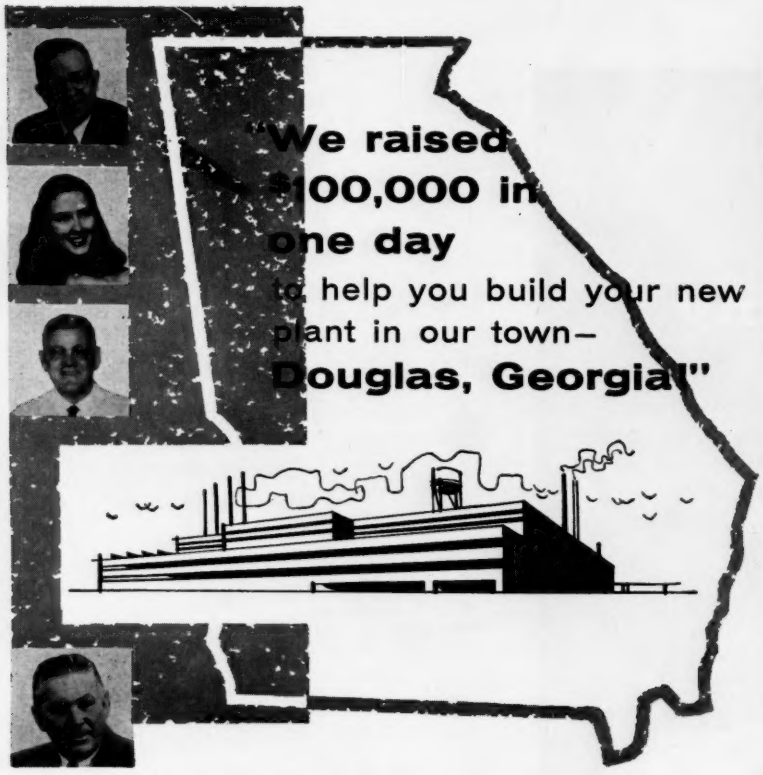

$100,000 in the first day! That's what the 8,200 people of Douglas pledged to help new industry settle in Georgia—a remarkable feat for so small a town but typical of the vitality which marks Georgia's economic progress!

Douglas will *now* finance a new plant up to 100,000 sq. ft. This financial aid, however, is only one of Douglas' prime assets. A readily available labor force (59,000 population in a 25 mile radius) is willing to work and easily trainable. A model Urban Renewal Plan, one of two in the nation backed by Federal aid, has been initiated. Eight buildings, 14,000 to 200,000 sq. ft., and numerous sites are available. Beyond this Douglas has the basic advantages of Georgia: excellent transportation, low cost power and water, mild climate, a central location among major southeastern markets!

The people of Douglas and Georgia are working hard planning how best to put their resources at your service. Join their profitable progress by locating in Georgia! Call, wire, or mail the coupon for details! All inquiries confidential.

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Send me the facts about Industrial Georgia, especially concerning_____

Name_____ Position_____

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This message sponsored jointly by: *The State of Georgia, and the Douglas, Ga., Chamber of Commerce.*

ADMINISTRATION

has been struck since May 13 by the International Chemical Workers Union. And at Marietta, O., members of two Oil, Chemical & Atomic Workers Union locals refused a three-year contract and struck the ferroalloy plant of Union Carbide's Electro Metallurgical Co. division. The company offer included wage increases averaging 12¢/hour and fringe benefits worth an estimated 6¢/hour.

Labor Law Challenged: The Commerce and Industry Assn. of New York is asking for a thorough investigation of the Walsh-Healey public contracts act. Its contention: the Walsh-Healey statute is inconsistent with the Fair Labor Standards Act, has resulted in confusion and uncertainty in industrial wage situations.

KEY CHANGES

Raymond H. Filsinger, Jr., to vice-president in charge of sales, Vanadium Corp. of America (New York).

James R. Kennedy, to vice-president in charge of industrial relations, Celanese Corp. of America.

John H. Hildenbiddle, Jr., to vice-president, Ulrich Mfg. Co. (Roanoke, Ill.), industrial pump maker.

William C. Bedoit, Jr., to market development manager, Commercial Development Division, Jefferson Chemical Co.

Ralph C. Read, to vice-president, Central Scientific Co., scientific equipment manufacturing subsidiary of Cenco Corp. (Chicago).

K. E. Marple, to director, Agricultural Research Division, Denver Agricultural Research Laboratory, Shell Development Co. (Emeryville, Calif.).

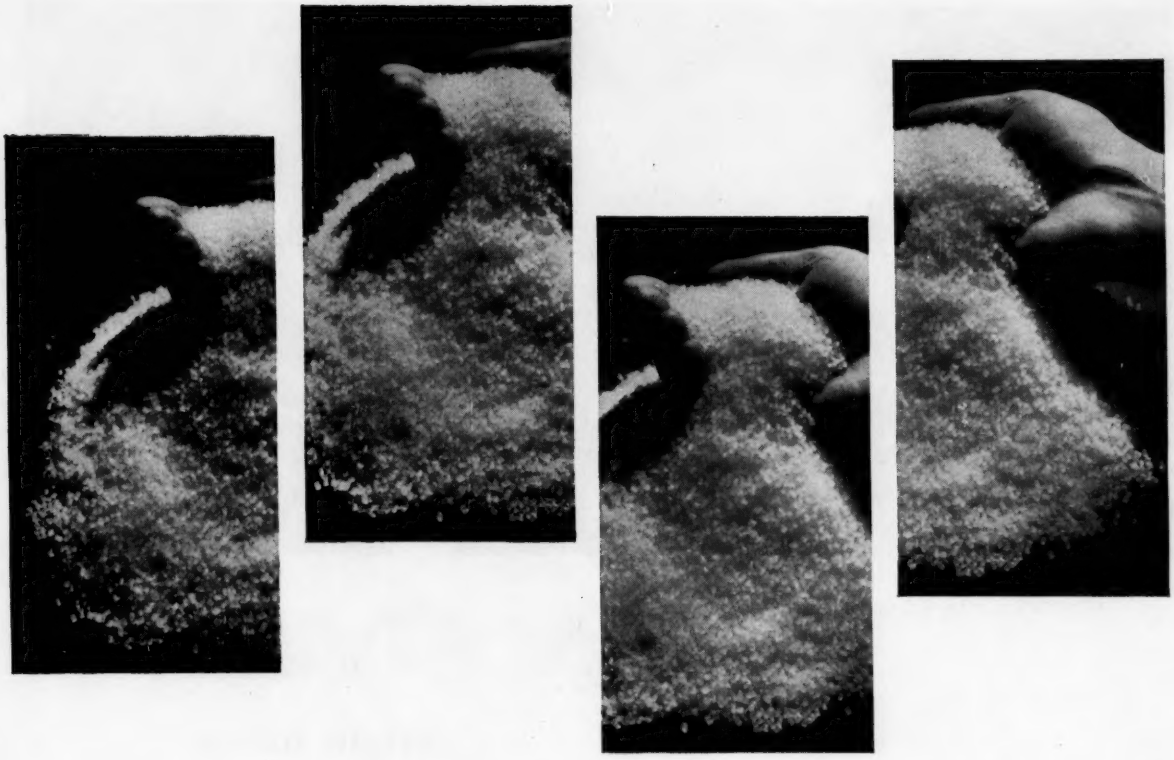
Donald K. Ballman, to director of sales, Dow Chemical Co.

CONSULTANTS

Jack Tielrooy, former vice-president of engineering and development, Brea Chemicals, is establishing a chemical-engineering consulting firm (Fullerton, Calif.).

DIED

Joel M. Bowlby, 70, former president, Eagle-Picher Co. (Cincinnati), at Philadelphia.



EPOLENE Eastman's versatile synthetic wax

offers hardness, toughness, high gloss and color stability

Epolene, a low-viscosity, low-molecular weight polyethylene wax, offers properties useful to many different industries.

In polishes, for example, Epolene produces a high gloss, anti-slip finish that resists water spotting, scuffing and yellowing. Furniture, floor, automobile and shoe polishes, as well as industrial waxes all are being given improved gloss and longer life with Epolene.

In the paper industry, converters look to Epolene fortified paraffin for superior performance. Adding toughness and durability to paraffin, Epolene effectively increases resistance to cracking, abrasion and rough handling.

From candles to crayons, from carbon paper to condensers, you get better product performance when you use Epolene-fortified wax.

Epolene is easy to use, too. It comes in the form of tiny pellets that melt down quickly for blending with other materials. With paraffin it can be blended at temperatures as low as 180°F. It is consistently uniform—viscosity is held within narrow limits, shipment after shipment. By standardizing on Epolene, you can confidently standardize your blending formulas and procedures.

If you use wax in your product, investigate the possible advantages of using Epolene. Thanks to Epolene's synthetic origin you are assured of a steady supply at a stable price. Send for samples and a booklet describing its properties and uses. Write EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE.

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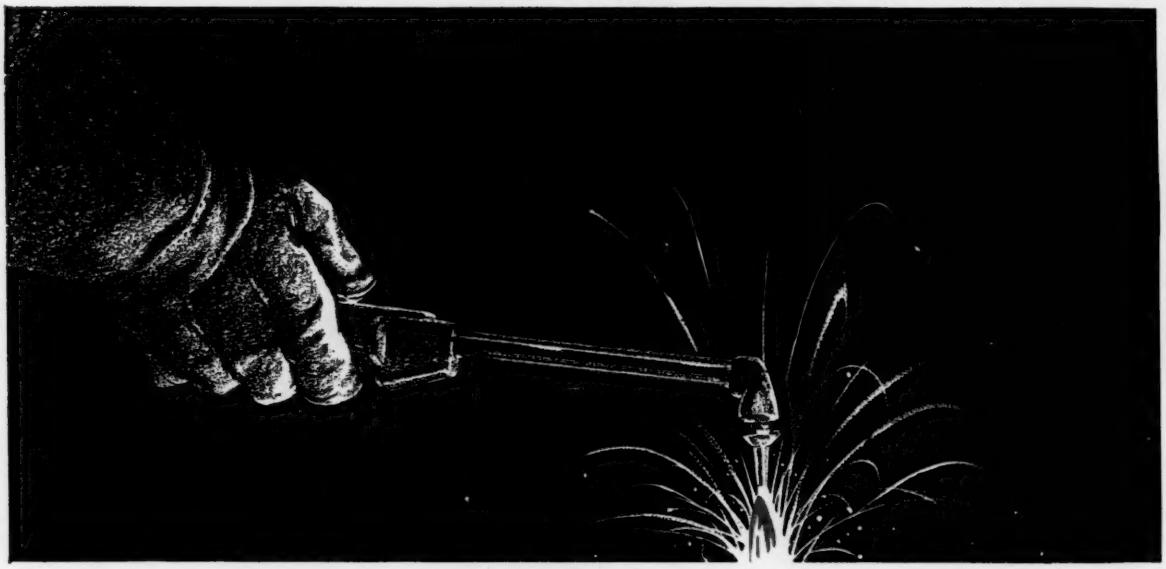

ACETYLENE

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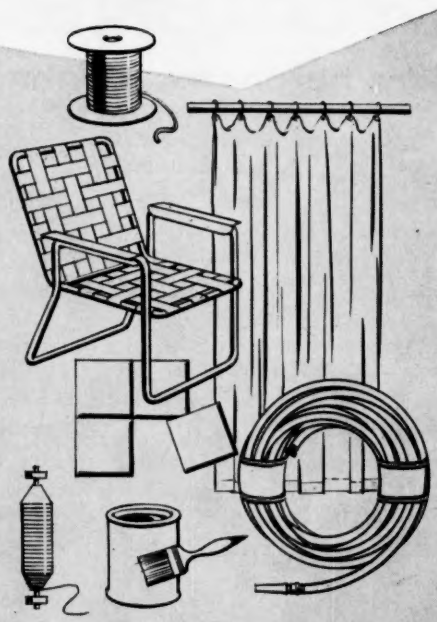
For years the use of acetylene commercially was limited primarily to the welding torch. Today, it is one of the brightest stars on the petrochemical horizon, with some 80% of total output serving as basic raw material for many of the "miracle" synthetic fibres and hundreds of other important plastic products, including *acrylic fibres, resins, solvents,* and *synthetic rubber.*

Key factor in the phenomenal growth of acetylene has been the recent development of processes for its production from natural gas. Among these new production techniques, the BASF process has had the greatest success, because of its commercially proven economy, safety and reliability.

With exclusive rights in all North American countries* for the BASF process, Chemico has designed and constructed facilities for the production of more than 150,000,000 pounds per year capacity of acetylene. This total includes the world's largest plant for producing acetylene from natural gas. This experience enables CHEMICO's highly skilled staff to handle acetylene projects with maximum efficiency and economy.

*On occasion those rights have been extended to other areas, through special arrangement with BASF.

If you are interested in the profit making opportunities offered by acetylene, we suggest you send for CHEMICO's new acetylene brochure (Bulletin No. 257), which will give you more detailed information on the BASF process and CHEMICO's experience in this field.



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Technology
Newsletter

CHEMICAL WEEK
September 14, 1957

New female hormones that may find use as oral contraceptives are likely to give rise to a great deal of interest. The British Drug Houses Ltd. (London and Godalmin, Surrey) has one under study: 6α:21 dimethylethisterone. Upjohn has one, too, but it isn't talking about the drug's structure.

Both drugs will probably be touted for their therapeutic properties. They're cheap (as steroids go), believed safe, and, taken orally, demonstrate anti-ovulatory properties. Earlier this year, of course, G. D. Searle got FDA approval for its Enovid (17 ethynylestreneolone) for use in menstrual disorders. And that compound, too, is known to be a member of a class of oral contraceptives.

But don't look for the newcomers to be marketed as oral contraceptives. For, aside from objections on ethical grounds, FDA approval for such a product in the required dosage would take several more years of tests.

•

Solvent extraction of metals may be gaining popularity. So far, the technique has been largely confined to uranium. But C. J. Lewis and E. H. Crabtree, of Colorado School of Mines Research Foundation at Golden, Colo. (an organization not affiliated with the school of mines itself), told the American Mining Congress in Salt Lake City this week that it may well find applications with other metals. They caution, however, that "reagent costs—or at least reagent losses—must be greatly reduced before the process can be made economically attractive for other than high-priced metals"—metals such as yttrium and thorium.

But they have worked with other metals (among them chromium, vanadium, nickel, iron, zinc, titanium, molybdenum), and they feel that the whole technology of solvent extraction of metals is a fertile one.

Among the extractants they tested were a liquid cation exchanger, 2-di(ethylhexyl) phosphoric acid and a liquid anion exchanger, R&H Amine 9D-178. In their system, the ion exchanger is dissolved in kerosene. This is mixed intimately with the metal in aqueous solution. The metal migrates to the organic phase; an equivalent of corresponding ion leaves the organic phase. Then the metal-rich organic phase is stripped with a suitable agent.

•

Production of reactor-grade graphite has been begun by Graphitwerke Kropfmuehl, according to a report from Germany. It will start with a mineral containing about 20% graphite as crystal flakes. It will be concentrated by flotation, purified by an undisclosed process using

high temperatures. Powdered product is pressed at 3,000 atmospheres to a block with a density of 2.07 grams/cc.

Cyclododecatriene has been produced by use of a new synthesis developed by G. Wilke, of the Max Planck Institute for Coal Research in Muelheim-Ruhr, Germany.

It's made from butadiene with the aid of an organometallic catalyst. The German researchers see the cyclic product as a useful starting material for making polyamides, polyesters, other resins—but not as a ring compound. It would first be split into a 12-carbon straight chain material.

•

Pilot-plant production of ceramic fuel elements is expected to get under way next spring by American Lava Co., the wholly owned subsidiary of Minnesota Mining & Mfg. The site tentatively picked out: at the firm's plant in Chattanooga. But other sites are still under consideration. Construction will get under way as soon as the site is settled on.

3M also revealed this week that it is now building a small nuclear research center. The unit will be finished next month.

•

A new method to extract alkaloids from plants should give a boost to alkaloid research (*CW, Nov. 3, '56, p. 104*). The method, developed at the University of California School of Pharmacy, employs ion exchange to extract alkaloids. It speeds up the extraction and gives yields that are as much as 10% higher.

Four new families of psychosedatives—tranquilizers of the class of chlorpromazine and reserpine—were reported by Eli Lilly researchers this week at the American Chemical Society meeting in New York. The work, too, tends to uphold a theory about psychosedative action.

Previously, says Lilly, all the potent tranquilizers were related chemically to either reserpine or chlorpromazine. Lilly researchers hit upon the new approach while studying certain adrenergic blocking agents. The agents have little effect upon adrenaline in the brain but interfere with the action of adrenaline in the body. But, it was found, in high dosages they acted a lot like reserpine and chlorpromazine. It was theorized that at high dosages, they were blocking action of adrenaline in the brain and that possibly this was what reserpine and chlorpromazine did too. And if so, the adrenergic blocking agents should be capable of modification to produce new classes of tranquilizers.

Thirty scientists have spent several years studying some 1,000 compounds to come up with this working hypothesis. Cost to Lilly: more than $1 million. But two of the new compounds (ethoxybutamoxane and chlorethoxybutamoxane) have already shown 20 times the potency of chlorpromazine in tests on animals.

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Tris Nitro is a white free-flowing crystalline solid, derived from the condensation of nitromethane with formaldehyde. It is very stable when dry, but under conditions of high ambient temperatures and humidities, or in mildly alkaline systems, this reaction becomes reversible and formaldehyde is slowly released. Increasing the pH and/or the temperature accelerates this reaction. Tris Nitro, therefore, is an excellent reagent for odorless, controlled donation of formaldehyde and is used commercially in several industrial applications based upon this property. Available in 1-gallon, 5-gallon and 51-gallon fiberpaks. Write today for Sample and Technical Data.
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Solubility in Water, g/100 ml at 20°C 220
Very soluble in alcohols, sparingly soluble in hydrocarbons
*melts with decomposition
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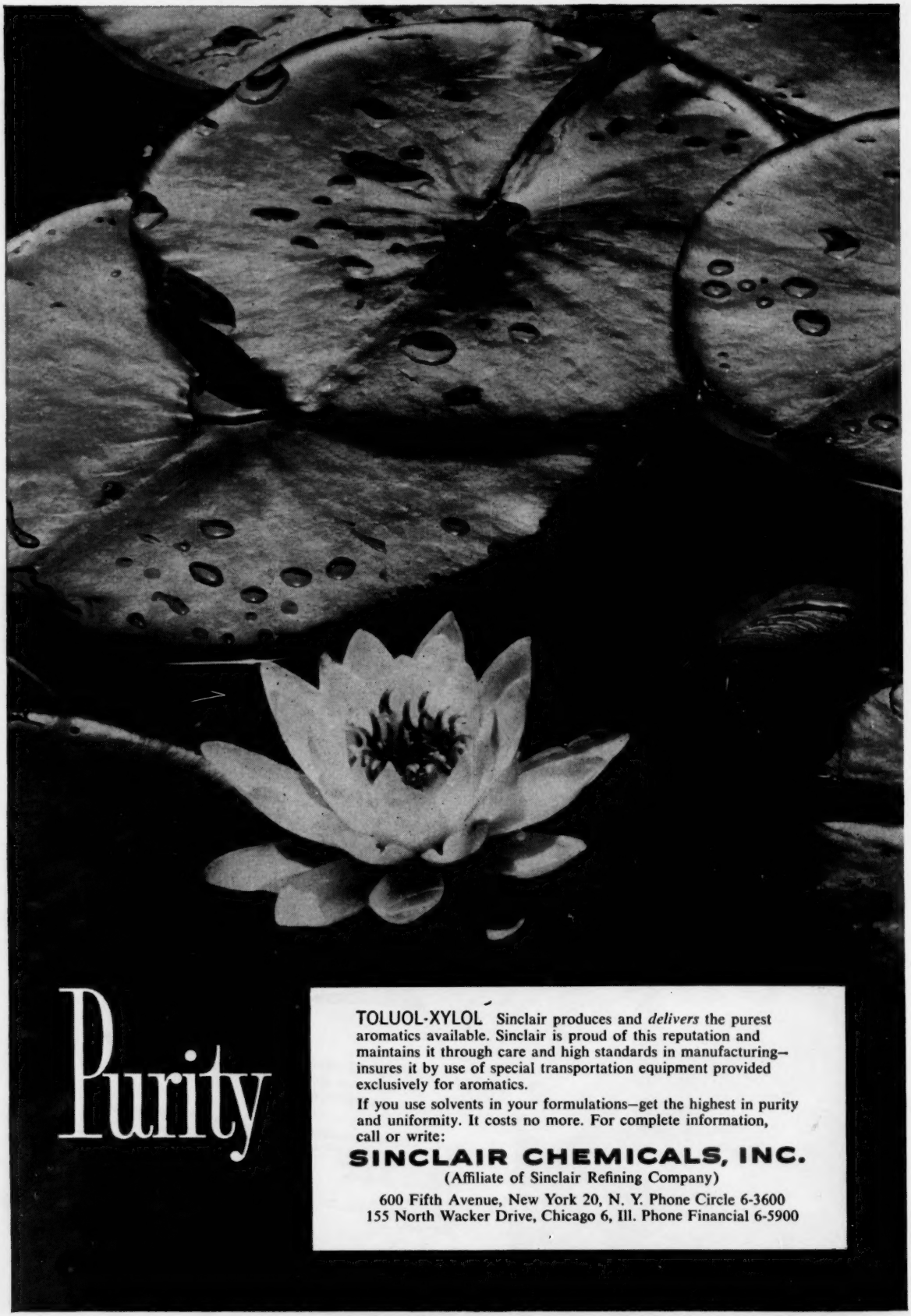

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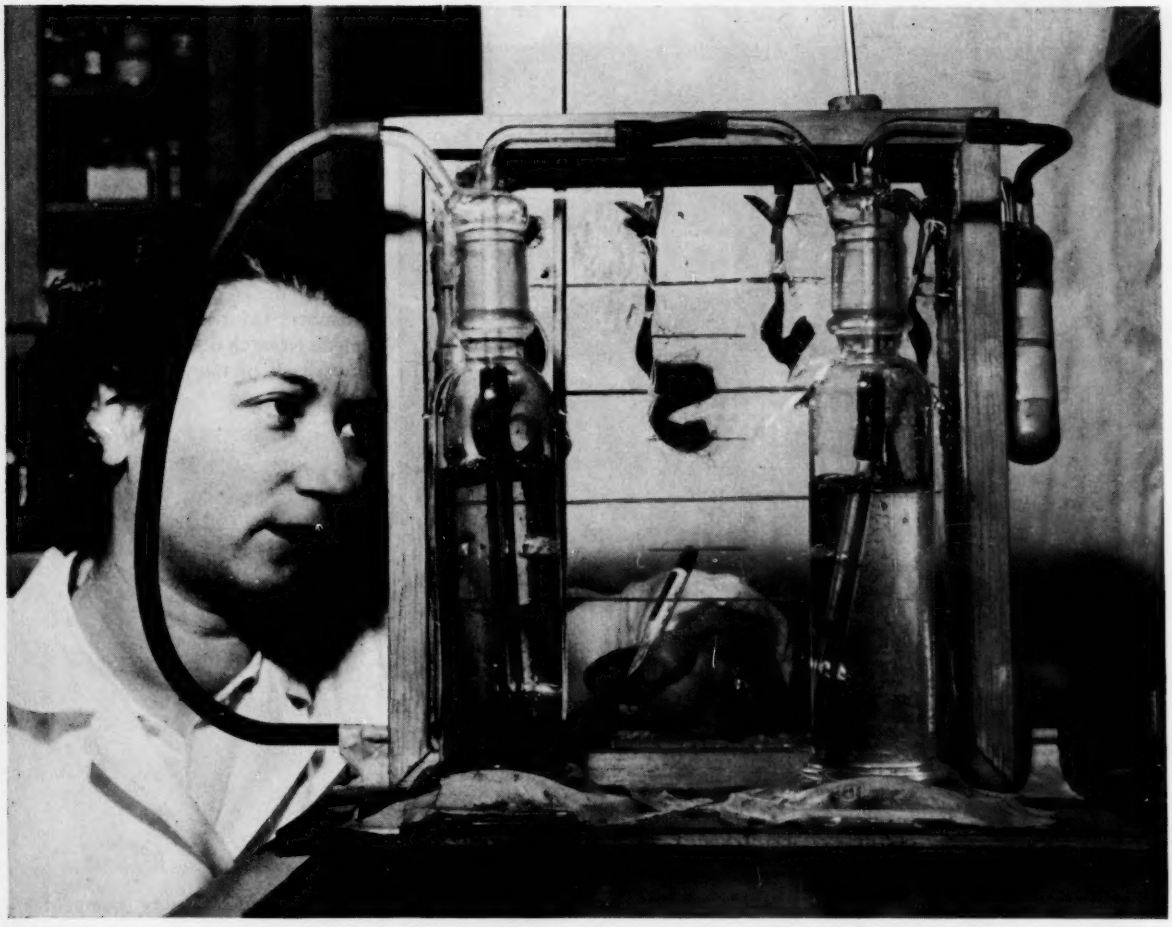


Research on hair curling, like that in other cosmetic areas, is adapting drug and chemical techniques.

Chemical Probes Yield New Cosmetic Aids

This week, a new face cream being readied by Helena Rubenstein (Roslyn, N. Y.) points up the new complexity—and, in a phrase, the changing complexion—of cosmetic research. The cream is the first of its kind slated for over-the-counter sales, contains the potent female hormone progesterone (10,000 international units/oz.).

The product illustrates the revolution under way in cosmetic research, —a revolution that's nowhere near its peak. In the mid-1930s, when cosmetics were placed under the jurisdiction of the Food & Drug Administration, manufacturers were compelled to prove their products pure, nontoxic and properly labeled. At first, just meeting these requirements made broader, serious chemical research a necessity. Now, the need for new, profitable products in the militantly competitive industry is sparking an unprecedented, multimillion-dollar investigative effort. (One of the industry's giants, Chicago's Toni Co., alone will spend $1.5 million on research this year.)

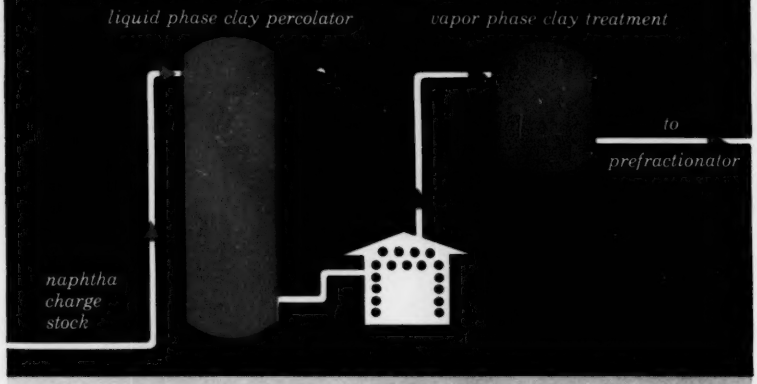
Rubenstein's new cream has been rigorously researched, clinically and otherwise. As proof, Helena Rubenstein can point to its recent FDA acceptance.

FDA has never been publicly quoted on claims for other estrogen-containing creams—which have been on the market for about 15 years. The materials reputedly increase water retention, "plumping" the skin. While the beautifying efficacy of such creams has been argued, there's been no serious contention that they are more than cosmetics. Helena Rubenstein's cream has received acceptance as a drug, not a cosmetic, despite its end-use. And that's another earmark of the new era in cosmetic research.

Cosmetic makers are finding new rapport with the drug industry. Revlon Products Corp.'s (New York) corporate wooing of drugmaker Schering *(CW, July 6, p. 25)* didn't surprise some seasoned cosmetic researchers. Neither did the establishment of such drug-cosmetic combinations as Warner-Lambert Pharmaceutical Co. and

MIN CHEMISTRY *at work*

case: How to remove poisons that foul platinum catalysts



Attapulgus Clay will protect you against losses caused by platinum catalyst poisoning. It does this by selective adsorption and catalysis —direct removal of the harmful compounds from the reformer charge.

Attapulgite Adsorbent Report: Feed stock passes through Attapulgite Clay-packed "guard case" equipment where troublemaking constituents are removed from the stream (some need only be present at *10 parts per billion* to temporarily—even permanently—foul the catalyst.) Poisons removed include: Arsenic—present in the crude or picked up along the way; Nitrogen—from crude or other sources (these by adsorption); Tetraethyl Lead—from refinery cross-contamination; Alkyl Sulfur compounds (these by catalysis).

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its Lambert-Hudnut division (Richard Hudnut, DuBarry, and Sportman cosmetics and toiletries). Steroids, antibiotics, vitamins, etc., are all potential beautifiers, they believe. Cosmetic research involving drugs is worlds apart from, say, developing new colors and consistencies for lipsticks.

At Rubenstein, for example, the researchers working under Edward Masters are developing a novel acne-control cream, also think vitamin A-containing cosmetic creams are beneficial. Donald Powers, Warner-Lambert (Morris Plains, N. J.) cosmetic research director, is looking into the effects of thyroid extracts applied

Revlon's Jass: Quality comes first.

to the skin, hopes they may prove beneficial when so applied. Also under development at his laboratory is a blemish-covering cream containing hydrocortisone. (However, cortisone-based over-the-counter cosmetics have not yet received FDA approval.) A West Coast firm that has looked at antibiotics in its products, has now ruled them out because of prohibitive cost. Toni also has been researching chemotherapeutic compounds for its cosmetics, thinks they may eventually enhance the latter's usefulness.

Along with this trend, there has been an industry-wide surge in instrumentation analysis research. Reason: FDA rules on product control are strict—will probably be even stricter when drugs are involved in over-the-counter cosmetics.

Instrumentation looms large in the plans of Herman Jass, head of Revlon's cream research. Jass feels precise

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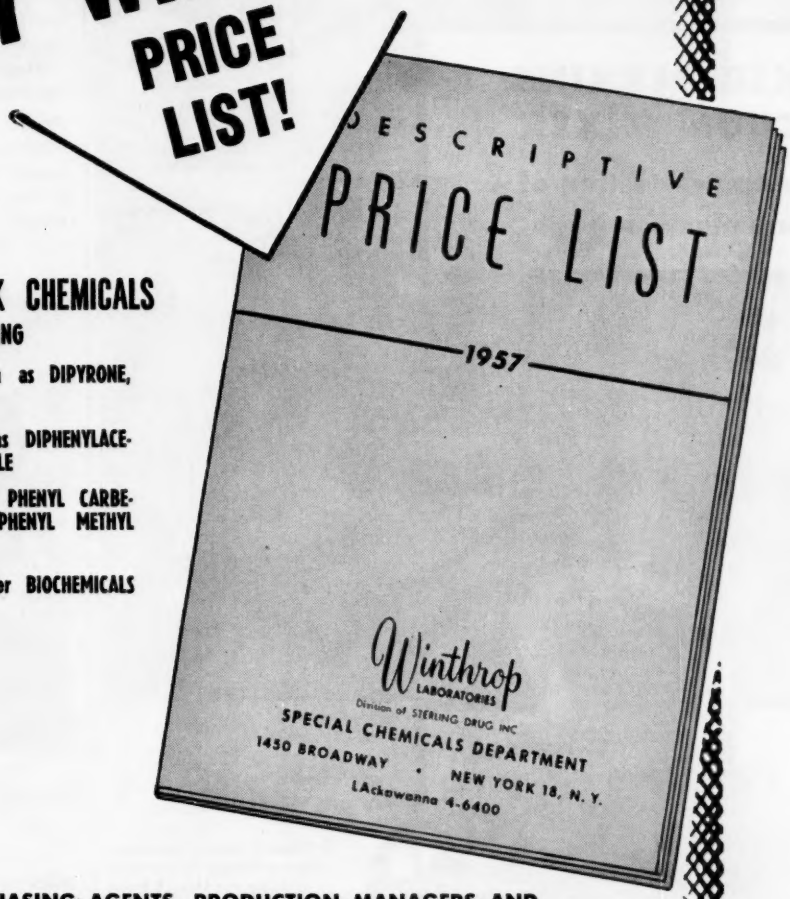

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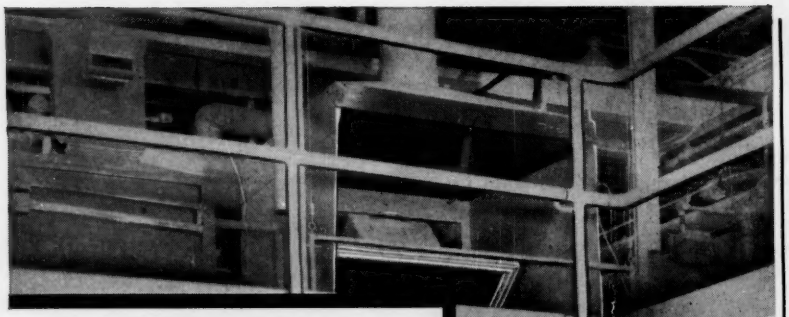
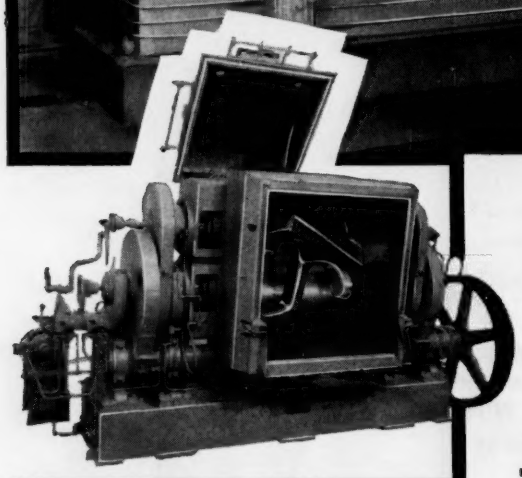


BAKER PERKINS VACUUM MIXER

steps up production of silicone elastomers



• General Electric Company's Silicone Products Department is using this Size 18 Baker Perkins Mixer in the production of silicone elastomers at its modern plant in Waterford, New York.

The size 18JWUMM2 B. P. Mixer was designed specifically to meet this customer's exact mixing requirements. It is a big, heavy duty unit, that was built to the same high standards of materials and workmanship that have made Baker Perkins the leader in the mixer field for over 64 years.

The same, dependable *Baker Perkins* vacuum mixers which have given unfailing service in such processes as compounding paints, rocket fuel and plastics, are finding immediate and enthusiastic acceptance in still other fields . . . silicones being only one of these.

If your production requires dependable mixing machinery which is capable of long service at lowest maintenance and operating costs, it will pay you to consult a B-P sales engineer . . . or write us today.

351

BAKER PERKINS INC.

CHEMICAL MACHINERY DIVISION • SAGINAW, MICHIGAN

knowledge of cosmetic composition is important, too, "as a matter of scientific propriety" and in warding off customer complaints. Revlon, as a result, has assembled an impressive array of analytical tools—including a gas chromatograph, which can be used to analyze organic substances or any inorganic substance that can be distilled below 300 C.

Hair Raiser: Although the drug segment of cosmetic research is sizable, it pales before other chemicals-in-cosmetics research. Take the $550 million a year hair product (shampoos, dyes, curling lotions, etc.) field, for example. On home permanents—which have zoomed to $100-million/year sales in the past decade—there is a definite split in research philosophy. A key ingredient, ammonium thioglycolate, which makes the hair pliant before neutralizing, is the only compound of its type acceptable to FDA for home permanent use. One school of researchers believes there won't be any appreciable change in home permanent chemistry in the near future. But others, such as Rayette, Inc.'s (St. Paul, Minn.) Ross Whitman, think differently. Whitman is trying to get monoethanolamine thioglycolate (used in "hot" permanent waving) to work in cold waves, says it is less toxic and less irritating than ammonium thioglycolate. Simplicity, of course, is the mainstay of home permanents. This year, both Warner-Lambert Pharmaceutical and Toni unveiled products

Masters: A 'first' with progesterone.

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that require no separate neutralizer.

Still to be attained is a permanent-wave solution that would be odorless and cause hair to curl without causing it to deteriorate. With present compounds, hair becomes brittle and breaks after about two or three applications.

Hair sprays ($70 million/year) are prime candidates for research to find better and cheaper ingredients. Polyvinylpyrrolidone, a key ingredient in some sprays, may have found a synthetic competitior in N-vinyl-2-oxazolidone (*CW, Aug. 17, p. 57*). A new entry, Warner-Lambert's Beauty Curl, uses unsaturated fatty acids, organic esters and silicones instead of PVP.

Other Targets: A good deal of cosmetic research is being directed toward improvement of products along conventional lines. At Hazel Bishop (Paramus, N.J.), for example, Angela Ricci, head research chemist, is looking for better lipstick colors, odors and textures.

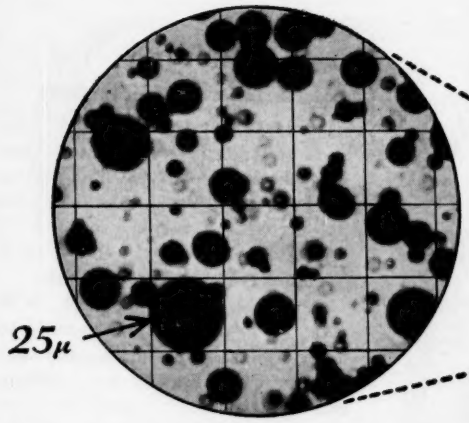
One omnipresent ingredient of cosmetics, perfumes, is getting limited study, but not much. The industry is looking at better ways to check the composition of the perfumes it buys but hasn't found it feasible to make perfumes itself. So, for the foreseeable future, perfume makers—whose subtle skills are highly specialized—will be supplying new scents.

More dramatic products, too, are being searched far. One of these is a depilatory that removes hair without taking off skin—one that can be used in daily shaving. Both cosmetic makers and their chemical suppliers are interested in these problems.

However, they're not saying much about their progress. In the sharply competitive industry, chemists are often forbidden by their companies to publish reports of significant findings in technical journals. That's a traditional situation, which some observers believe may have kept the industry from greater gains.

Scientists Meet Despite Cold War

Russian scientists got a friendly reception at the recently ended Gordon Research Conferences in New Hampshire (*CW, Aug. 3, p. 64*). N. N. Kavtaradge (*second from left*) of Moscow's Academy of Sciences, and G. Samsonov (*right*) Academy of Sciences (Leningrad), shown at the elastomer conference in New London, are among the 124 foreign conferees making their way home to more than 30 nations this week.



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Interest sparked by the discovery that lithium metal dispersions make unique polymerization catalysts (the polymerization of isoprene to a "natural" rubber) indicates a heretofore unexploited instrument of research.

Consequently, Lithium Corporation is now making available experimental quantities of dispersions of this highly reactive metal. These dispersions may be purchased in either mineral oil or a mineral oil-petrolatum combination as the dispersing medium. Dispersions in other media are available as special items. The "package" is obtainable in five sizes from 25 grams to 1 pound. Over 90% of the lithium metal particles have a diameter less than 25 microns.

Specifications, information for preparing the dispersions including handling instructions, prices and product data on lithium metal may be obtained by submitting a request on company or institutional stationery.

... trends ahead in industrial applications for lithium

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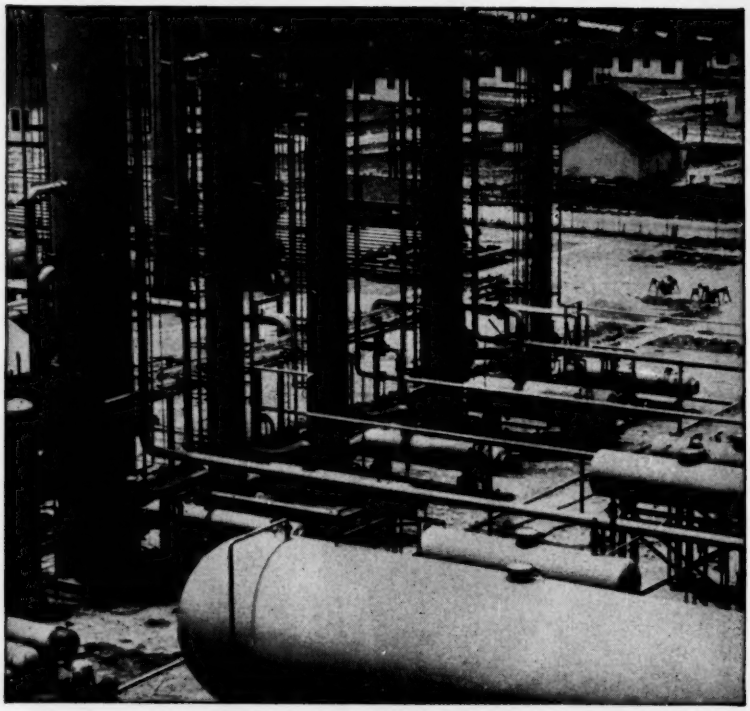

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RESEARCH

ACS in Manhattan

Some 14,000 members and guests were on hand this week for the American Chemical Society's 132nd national meeting in New York. More than 1,500 papers were presented in the 22 topical divisions of ACS. Those showing industrial significance include:

• "Living End" polymers (*CW, Aug. 31, p. 48*) can now be more actively initiated with lithium compounds such as phenyl lithium, styryl lithium, and n-butyl lithium in tetrahydrofuran solution. Maurice Morton, H. L. Stephens and J. L. Hall, of the Institute of Rubber Research, University of Akron, in reporting this find, claim the new initiators (which replace previously used sodium naphthalene) give almost instantaneous quantitative polymerization of styrene at room temperature.

• The flame resistance of neoprene, a material frequently used for retaining and transporting flammable petroleum products, can be increased, say J. F. Hagman, N. N. Mueller and D. C. Thompson, of Du Pont's Elastomers Laboratory. Loading increases the flame resistance of neoprene, although it varies with the individual filler, while plasticizers have an adverse effect on flame resistance.

• Eighty-five to 95% decontamination of radioactive sea water has been achieved in a single-stage stirring process using clays, phosphates, silicates and iron salts singly or in binary mixture. M. Honma and A. E. Greendale report research at the U.S. Naval Radiological Defense Laboratory (San Francisco) found sodium *o*-silicate to be the best single decontaminant. Their investigation revealed that alkaline silicates are superior to siliceous silicates in removal characteristics, may have direct bearing on procedures now used to eliminate radioactive wastes.

• General Motors research on the effect of engine variables on oxides of nitrogen in exhaust gases has shown the air-fuel ratio to be the most significant variable. Maximum concentration of the toxic gases occur when the air-fuel ratio is lean. Advance spark timing, higher manifold air pressures and higher compression ratios also favor higher concentrations of oxides of nitrogen, while engine speed has little effect. With higher compression ratios in the offing (*CW, July 13, p. 76*), this re-

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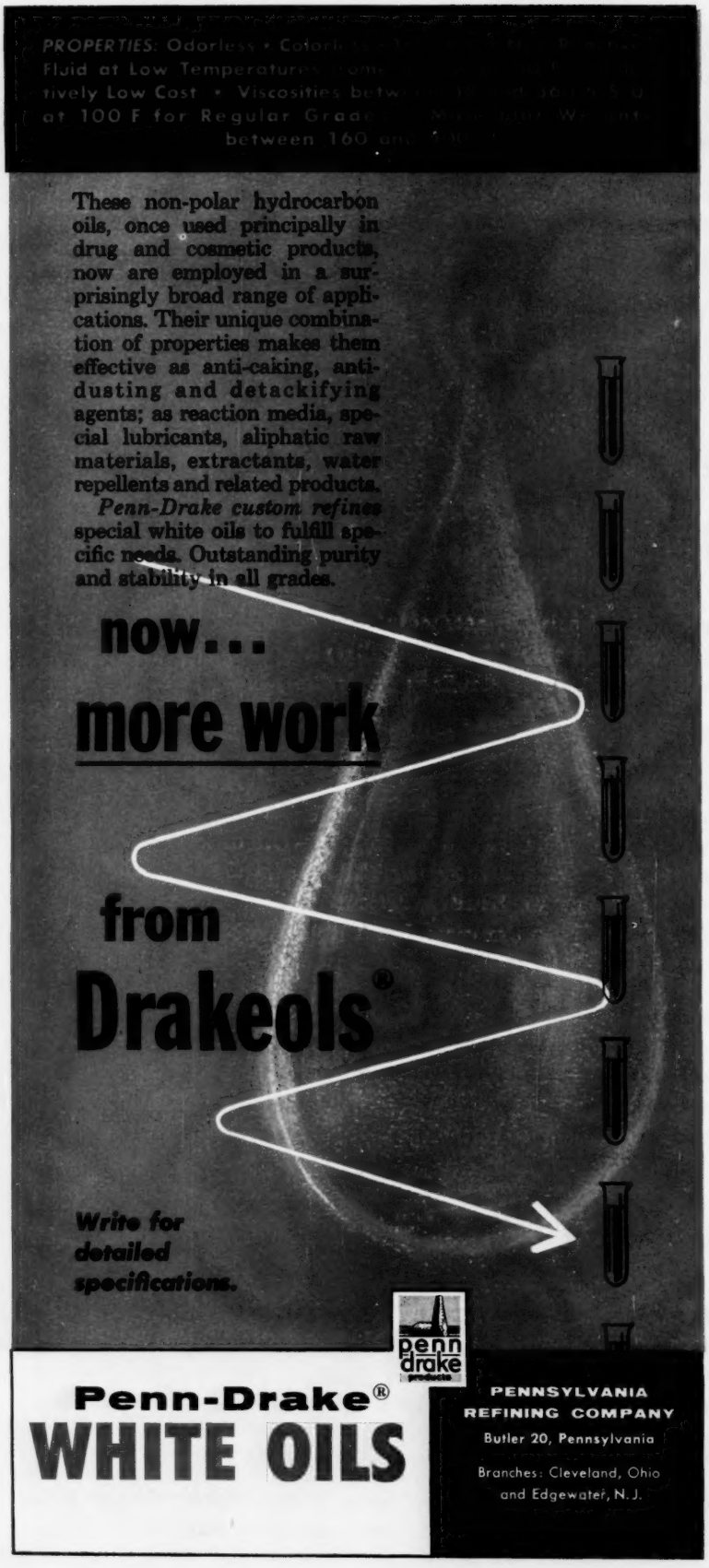
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RESEARCH

search may lead to engine redesign aimed at eliminating oxides of nitrogen, a possible major air pollution problem of the future.

• Bis-(S-[diethoxyphosphinothioyl]-mercapto)methane, a new organophosphorous pesticide reportedly possessing outstanding miticidal properties was discussed by Joe R. Willard, of Food Machinery and Chemical Corp. Dubbed Niagara 12-40, the new compound is produced by alkylation with a dihaloalkane of metallic salts of 0,0-dialkyl phosphorodithicates. A second paper presented by Willard covered the synthesis of Phostex, another organophosphorous pesticide. The most active component of the Phostex mixture is [(ethoxy) (2-propoxy) phosphinothioyl] (diethoxyphosphinothioyl) disulfide. It was produced by oxidizing a combination of phosphorodithioic acids formed by the reaction of ethanol and 2-propanol with phosphorous pentasulfide.

• A new one-step process to produce granular triple superphosphate was presented by representatives of TVA (Wilson Dam, Ala.). It's said to promise production economies, acidulates and granulates in one step, eliminates drying.

EXPANSION

• Monsanto Chemical Co. (St. Louis) has expanded its research and engineering divisions at Dayton, O., and has moved its inorganic chemical division to St. Louis.

• Harbison-Walker Refractories Co. (Pittsburgh) has started construction of a $1-million research center. To be completed next year, the center will house 100 employees, stress studies of silica, basic refractories and refractories for nonferrous metallurgy.

REPORTS

Stemming from the government's synthetic rubber program, 1,500 new reports on copolymer research cover work from July 1, '49, through April 30, '55. This collection supplements about 4,000 other papers released previously on the copolymer project. An index of the new reports is available from the Library of Congress, Photoduplication Service, Publication Board Project, Washington 25, D. C. Price: $11.10 for microfilm copy; $82.80 for

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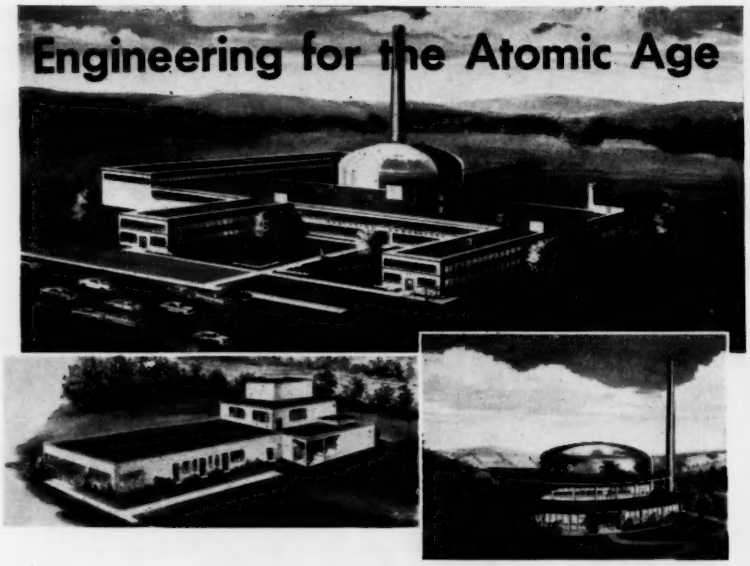

ADVANCED LABORATORIES DESIGN

THE engineering and design of laboratories of the advanced type has been a specialty of Vitro Engineering Company over the past few years. Several of its design projects include the increasingly necessary "hot labs", or nuclear radiation laboratories. Some are for other highly specialized purposes—such as nerve gas, high temperature or biological warfare.

Vitro's rôle in the hot lab field is exemplified in the design of new radiation laboratories for The Texas Company in Beacon, N. Y., the CP-5 reactor facility in Milan, Italy, and others for a major oil company, a large electronics firm, and a prominent university.

Other recent Vitro laboratory design contracts include:

- Nuclear Development Center for Lockheed Aircraft — Dawsonville, Ga.
- Elevated Temperature Facility for General Electric — Evendale, O.
- Navy Aero Ballistic Facility — Whiteoak, Md.
- High Temperature Facility for Wright Air Development Center — Dayton, O.
- Animal Disease Laboratory for the Dept. of Agriculture — Plum Island, N. Y.
- Biological Laboratory for the Army Chemical Corps — Fort Detrick, Md.

The selection of Vitro to handle these key projects reflects solid performance in modern advanced laboratory design.

The atomic age requires many types of nuclear engineering—reactor facilities, central power stations, disposal systems, plants for processing ore, separating isotopes, reprocessing fuel or producing heavy water. Vitro Engineering Company has played a significant part in these activities—in many cases designing the pioneer plant.

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The following new reports are available from the Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C.:

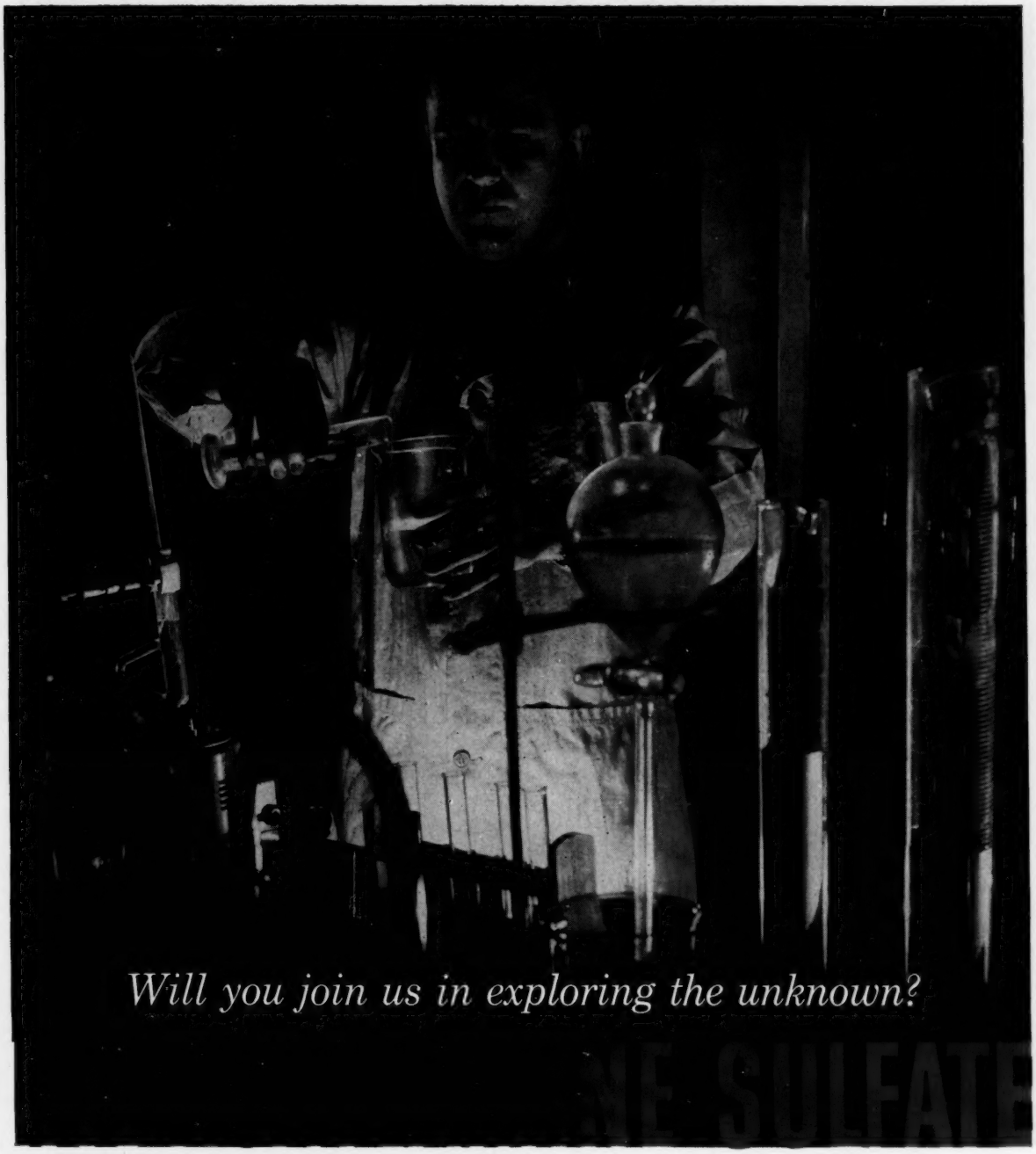
• "Chlorosulfonation of Silanes and Related Reactions" (PB 121973, $1, 37 pages) describes progress in the synthesis of polar organosilicon monomers capable of polymerization to synthetic rubber. According to the report, polar groups decrease the solubility of silicone rubber in organic solvents. The best of six syntheses was found to be direct chlorocarbonylation of tetraethylsilane with oxalyl chloride.

• "Development of Schematic Analytical Procedures for Synthetic Lubricants and their Additives: Part 3" (PB 131063, $1.50) covers advances in techniques for the separation, identification and determination of components of synthetic greases and lubricants. Among them is the column partition chromatographic separation of high-molecular-weight dibasic acid esters from silicate esters, disiloxanes and silicone oils.

• "The Effects of Nuclear Radiation on Military Specification Greases: Part 1" (PB 121914, 75¢) reveals that many of the 47 greases tested appeared to be satisfactory for use after exposure to about 1 x 10^8 roentgens of gamma radiation. Of those that were affected, the major characteristic changes were in penetration (increased softening), oxidation resistance, and endurance under high temperatures. Identification of the cause of these changes may help in development of radiation-resistant greases. Radiation appears most harmful to new high-temperature grease formulations, particularly those with polysiloxanes.

• Development of ceramic structural adhesives with high shear strength for bonding metals at high temperatures is detailed in "Research on Elevated Temperature-Resistant Ceramic Structural Adhesives: Part 2" (PB 121941, $2).

• "Tantalum Determination" (PB 121819, $1) describes improved methods of separating molybdenum plus tungsten from tantalum, niobium, titanium and zirconium. This development stems from research in precipitating metals with the organic reagents N-nitrosophenylhydroxylamine and N-benzoylphenylhydroxylamine.



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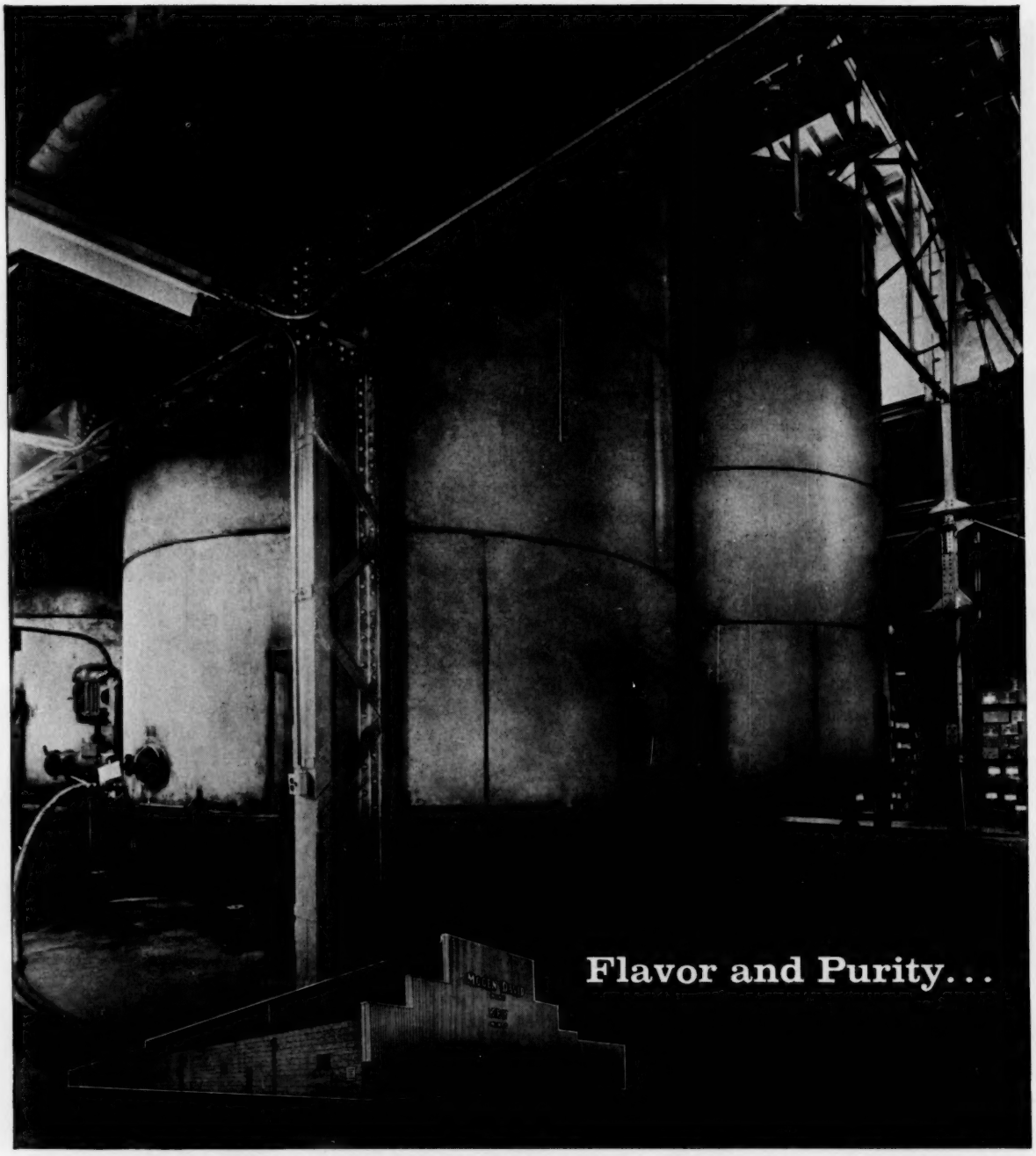

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Demerit system of quality control offers management . . .

- **A single number to evaluate outgoing quality**
- **A bird's-eye view of average quality**
- **An index that is easily interpreted**
- **Quick pinpointing of defects**
- **Data for long-term process and product evaluation**
- **A system for evaluating operations within a process**
- **A system with a philosophy based on customer needs**

Old System Still a Sharp Tool for Quality

Offer chemical management a tool for improving product quality that has the advantages listed above, and the chances are it won't be turned down. Yet, the demerit system of quality control has these advantages, and, more often than not, is completely overlooked, says Du Pont's Edward J. Delate, who outlined the system last Saturday as it is used by his firm's film department.

The system was developed by Harold F. Dodge, of Bell Laboratories, more than 25 years ago, and its age, explains Delate, is probably the reason why it has been lost in the shuffle. But it should be dusted off for re-examination by the chemical industry because it was developed to measure the quality of a complex product, then record the result as simply as possible—by using a single number.

By taking into consideration that defects—of the same and different types—are not of equal seriousness, the demerit system gives a truer picture of product quality than a record of the percent of nondefective production. Management can quickly pinpoint the reasons why a given product failed to meet standard or surpassed standard, because the defects are classified by categories that are well defined. How it works in the film department at Du Pont was outlined by Delate last Saturday.*

Three Tests: Quality control inspectors sample approximately 6% of production, observe all visual defects and collect chemical and physical analysis data from the laboratory. All defects are recorded on IBM cards, which are processed, given to a clerk for preparation of a monthly index.

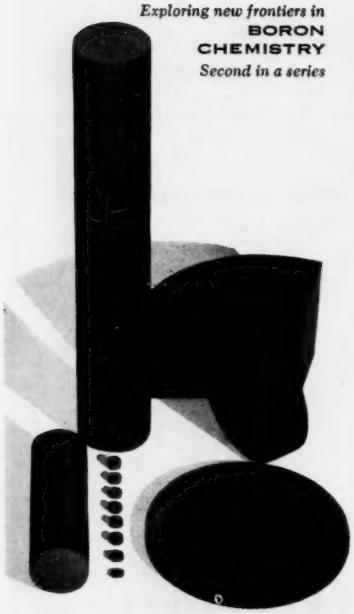
In one process, for example, 13 quality characteristics are checked (six or seven are chemical and physical; the rest are visual). Each characteristic is given a weighted demerit rating that falls into one of three categories:

- **Critical defects**—those that render the product completely unfit for use by the consumer—receive 10 times as large a demerit as does a minor defect. Of the 13 quality characteristics, those included in this group are out-of-standard plasticizer, moisture and unit weight, and shape and lack of coating of the film.
- **Major defects**—those that may cause operating failure, decrease the service life of the product—receive five times as large a demerit as does a minor defect. Included in this group are fibrous base off-center, color, acidity and faulty mend.
- **Minor defects**—those that will cause a slight nuisance to the consumer—receive the smallest demerit rating. Included in this group are a break in the film, foreign material, nodules and knots.

The important point in the weighting is not the numerical value assigned to the three classes of defects, but the ratio of 10:5:1. In other words, a critical defect is 10 times as important as a minor defect, will cause 10 times the difficulty.

*Speaking to the chemical and pharmaceutical processing panel at the Rutgers Conference on Quality Control in New Brunswick, N. J. The one-day conference, held for the ninth year, is sponsored by the Metropolitan Section of the American Society for Quality Control.

Exploring new frontiers in
BORON
CHEMISTRY
Second in a series



BORON SHAPES for control rods and shielding in nuclear reactors, supplied through our National Northern Division, West Hanover, Mass.

ELEMENTAL BORON

To meet your growing requirements, TRONA* offers a versatile selection of these standard and special grades...

STANDARD 90-92% AMORPHOUS	SPECIAL HMG HIGH MAGNESIUM
SPECIAL MGR MAGNESIUM REACTIVE	SPECIAL NAR SODIUM REACTIVE
HPA 95-97% HIGH PURITY AMORPHOUS	

The selectivity available to you with Trona Elemental Boron is the natural result of AP&CC's long pioneering leadership in Boron Chemistry. If you're concerned with the many new development possibilities of Elemental Boron – its Ordnance uses, high temperature applications or nuclear aspects – we suggest you call your nearest Trona representative, or write

MARKET DEVELOPMENT DEPARTMENT

TRONA

*TRADEMARK AP&CC

American Potash & Chemical Corporation

3030 West Sixth Street, Los Angeles 54, Calif. | 99 Park Avenue, New York 16, New York

Though in this example no defect is classified more than once, it is possible to set up the system for multi-classification. Delate points out that in the case of polymer viscosity, if viscosity falls within the specified 3-sigma limits, it gets "good" rating. If it falls between 3 and 4 sigma from the optimum, it gets a "C" rating, and between 4 and 5 sigma, a "B" rating.

Expected vs. Observed: Once the defects for the month have been recorded, data are used in two ways—to perpetuate a value for quality that may be considered representative of what the process can be expected to turn out, and to compare with this expected quality.

The data must be rationalized to be used in the expected-quality value. If the defects for the month are abnormally high or low, they would throw the expected-quality value out of line. Rationalization removes spotty conditions, tends to smooth out the value.

Top Picture from "t" Value: To give plant and top management a bird's-eye view of production quality for the month, the actual, or observed, value is compared with the expected-quality value. Du Pont uses a form of the statistical "t" test: the observed-quality value is subtracted from the expected-quality value and divided by the square root of the quality variance.

The "t" value is plotted on a control chart, shows graphically to what sigma level the quality of the product departed from the expected for the month. The area between ±3 sigma is that of normal or expected quality. Above 3 sigma is significantly better, below 3 sigma is poorer than expected quality. If a larger number of demerits than expected occurs during a month, the "t" value shows up as a minus figure. And if this figure is greater than —3, plant management quickly recognizes that quality is significantly poorer than it should be.

On the positive side, of course, if quality is significantly better than expected, management can quickly locate the factors responsible for its success, consolidate its position with a permanent improvement in product quality. To facilitate rapid investigation, charts for the 13 quality characteristics are available in addition to the "t" chart for outgoing quality.

Delate pointed out that when this demerit system of statistical quality control is used by the film department, it is not the only quality check made on production. A screening of in-process material sorts good production from bad. In addition, other visual, chemical and physical tests are conducted. The demerit system gives management the over-all view.

Towers Tame Acetylene

Now there's experimental evidence to back up a theory that has been rapidly gaining favor in this country: packed towers are the best means of damping the effects of an acetylene explosion.

Companies in this country that have been handling acetylene under any kind of pressure have been installing packed towers as a safety measure for some time. The reasoning is that the towers take up the force of the blast, rendering it harmless.

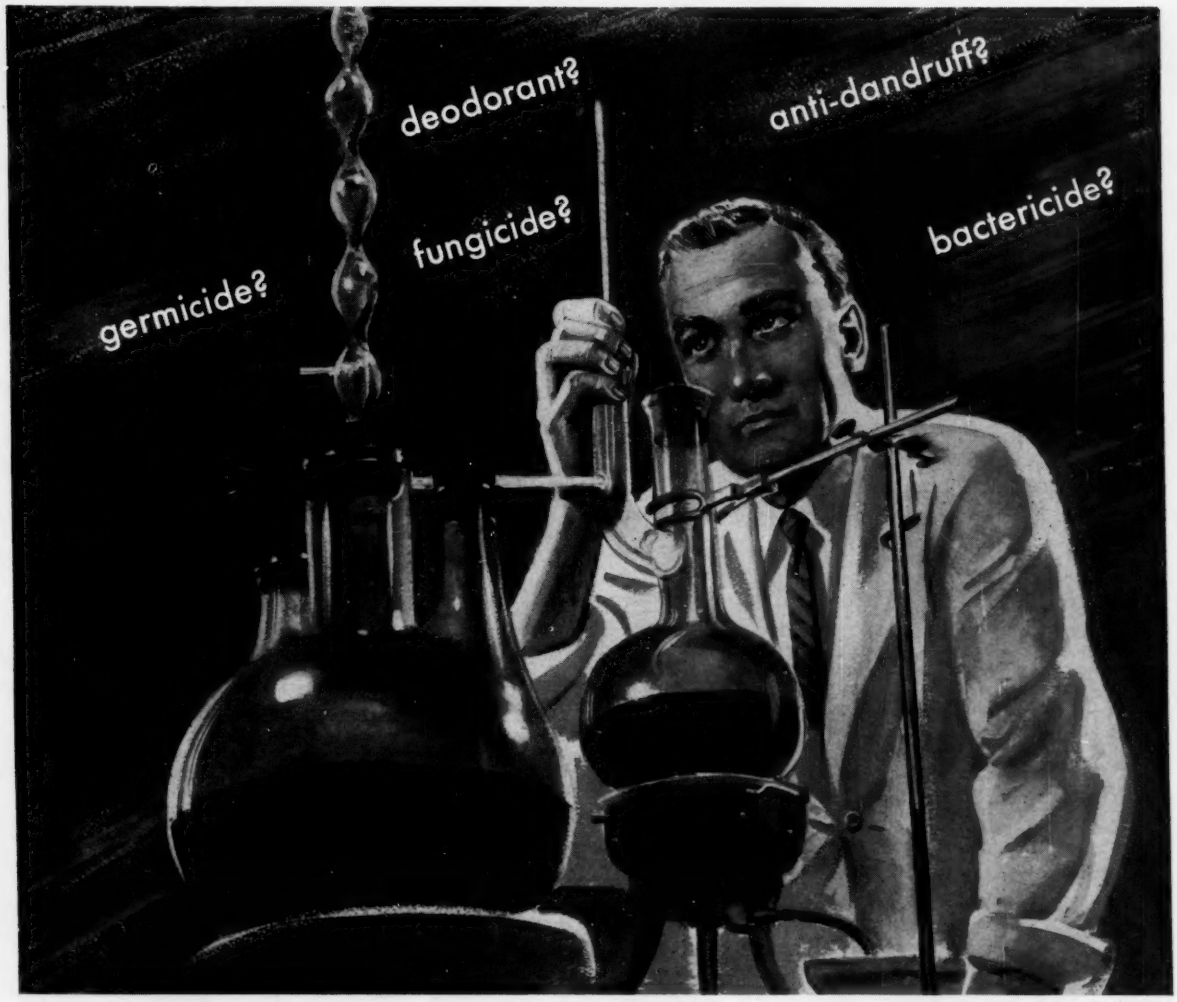
But next to nothing had been published on the subject prior to the Compressed Gas Assn.'s recent annual report, which gives the results of experiments carried out by Chemische Werke Huels* (Germany). The firm became interested in the project because of an explosion—in 1954—in its tetrachlorethane processing unit. Taking place right after an emergency shutdown, the explosion traveled through a large portion of the pipeline system (4-to 28-in.-diameter lines under pressure of 12 in. of water). Included in the damage was a gasholder and several process plants.

Tests Set Up: To simulate plant conditions, seven tests were run in a 65-ft. length of 12-in. ID steel pipe, using 97-98% acetylene at atmospheric pressure. The first decompositions were set off with the pipe unobstructed. Nondetonation explosions resulted in pressures 11 times the original. Detonations gave pressures 100 times the original, sheared off the bolts used to blank the pipe end.

Then, various decomposition barriers were installed in the system. Rupture disks and water sprays failed to stop detonation explosions. A bundle of small-diameter tubes stopped 13 decompositions (including three detonations), but failed to stop the fourteenth.

Quick-closing valves—closed com-

*And reported on in a talk in Canada by Shawinigan Chemicals' D. J. Kennedy.



ASK THE MAN FROM VANDERBILT . . .

About two recent developments in bactericide-fungicide active ingredients for cosmetic and pharmaceutical products.

VANCIDE 89RE—A new purified form of N-trichloromethylmercapto-4-cyclohexene-1, 2-dicarboximide showing promise as an anti-dandruff agent, and in many other areas where a germicide is advantageous. Vancide 89RE is quite insoluble, but very effective either in solution or when present as undissolved particles. It is even effective as an ingredient of dry dusting powder. Vancide 89RE is a fine white powder that may be stored indefinitely.

METHYL TUADS—A tested and proved deodorant which reduces the number of odor producing bacteria on the skin. It is a stable white powder with a wide range of germicidal activity. This is our trade name for tetramethyl thiuram disulfide produced by our own high purity process.

WRITE TODAY FOR SAMPLES AND TECHNICAL DATA

Please send:
☐ Sample ☐ Bulletin 116C .....on VANCIDE 89RE
☐ Sample ☐ Data Sheet .....on METHYL TUADS
.....(state application)

NAME_____

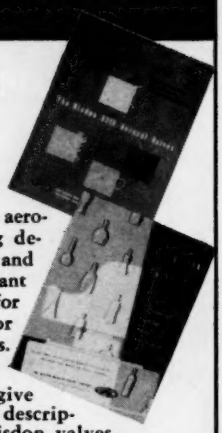
POSITION_____

(Please attach to or write on your company letterhead)

R.T. VANDERBILT CO. SPECIALTIES DEPARTMENT 230 PARK AVE., NEW YORK 17, N. Y.

FREE INFORMATION
ON
AEROSOL PACKAGING

Send For These Risdon Valve Booklets

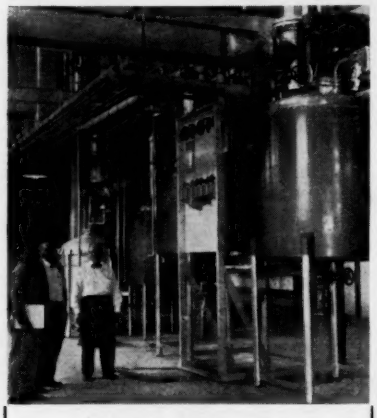


Basic general information on aerosol packaging describes 2-phase and 3-phase propellant systems used for glass, plastic or metal containers.

Booklets also give an illustrated description of the Risdon valves and actuators for both conventional and 3-phase applications . . . including alcohol-base and water-base products, ultra-low pressure applications, foam products and products not soluble in propellant.

Write Dept. C and ask for Aerosol Valve booklets.

RISDON
RI-86
THE RISDON MANUFACTURING CO.
Valve Division
Naugatuck, Conn.



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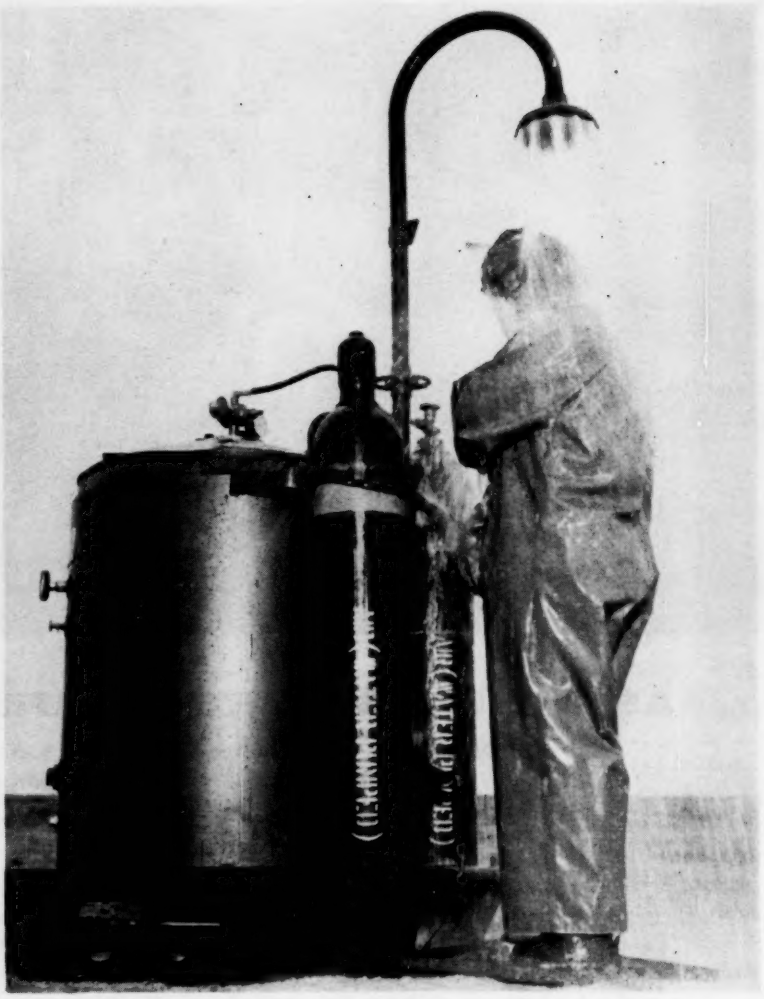
ALUMINUM ISOPROPYLATE
Dependable Deliveries from a Dependable Supplier
CHATTEM CHEMICALS
Chattanooga 9, Tennessee
Address Inquiries to:
F. L. BODMAN COMPANY
101 N. 33rd St., Philadelphia 4, Pa.

pletely in about 3/100 second from the time of triggering—proved effective, but the idea was dismissed as being too costly for larger lines.

However, a tower about 3 ft. high and 20 in. in diameter, packed with Raschig rings, also stopped all explosions and was considered practical. Although both dry and continuously wetted (acetylene-saturated water) towers turned the trick in static and 2-ft./second flow systems, the wetted tower was preferred. With dry packing, 35-mm. Raschig rings stopped the decomposition completely, but the decomposition passed about half way into the tower when packed with 50-mm. dry rings.



Safety Shower by Air Power

When personnel at guided missile launching sites come into accidental contact with liquid propellents, they now use another form of air power to shower away the nitric-acid and hydrogen - peroxide contamination. Placing a foot on the shower treadle opens a valve on an air cylinder, places the 100-gal. water tank under 45-psi. pressure to force water out the spray head.

The portable unit (weighs 220 lbs. without water) was designed by John F. Christian at the U.S. Army Engineer Research and Development Laboratories (Ft. Belvoir, Va.). Lofstrand Co. (Rockville, Md.) has turned out 2,000 units for Army use.

How this gum man got unstuck

(Dow salesmen welcome another increase in Methocel production)

Few products have won the approval of industry like Methocel® (Dow methylcellulose). The ability of this synthetic gum to end viscosity-control and other production problems has brought an increasing demand from manufacturers of paint, paper, pharmaceuticals, shampoo, foods and a host of other products.

So great has been demand that our salesmen at times found themselves empty-handed. They had a gem of a product to sell, but it didn't need selling.

We've been producing Methocel as fast as men, machines and money can operate. We've expanded and expanded and now have expanded again . . . making available a *family* of Methocel products that includes nine types in a wide range of viscosities.

This improved situation assures better scheduling of shipments. And if you would like to do research and development work with these synthetic gums of never-varying quality, we'd be pleased to send a sample. THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. BD 839A-1

YOU CAN DEPEND ON DOW

EQUIPMENT

Dry-Bearing Material: Crane Packing Co. (Morton Grove, Ill.) has developed a new bearing material for service where lubrication is a problem. Called Chemloy, the composite material is recommended for sliding and rotating dry bearings at temperatures up to 500 F. Chemloy will withstand speeds up to 1,000 rpm., loads to 100 psi. It resists solvents (e.g., acetone) and most corrosives.

•

Plug-Valve Operator: A new line of medium-duty plug-valve operators for air, gas, oil and water service, is offered by Ledeen Mfg. Co. (El Monte, Calif.). The valve operators can be used for a wide range of control applications, including process cycling and safety and automatic shutoffs. Pressure range: up to 200 psi.; torque range: up to 94,000 in.-lbs.

•

Liquid-Level Control: For high-pressure, high-temperature liquid-level control, Auburn Spark Plug Co., Inc. (Auburn, N.Y.), has now made available for general process use its HP10 electrode. The item was originally developed for use in removing water from helium. The electrode features a new glass-centered electrode seal, and uses a copper compression gasket. Shell is stainless steel; insulator is 95% aluminum oxide. The electrode is not suitable for service with hydrofluoric acid.

•

Pipe Cutter: H&M Pipe Cutting and Beveling Machine Co. (Tulsa, Okla.) is out with a new attachment for its standard pipe-cutting and beveling machines that, it says, will eliminate inaccurate cuts and bevels on "out-of-round" or imperfect pipe. Through spring tension, a constant pressure is applied to the roller rod, which forces the wheel to follow the pipe contour and maintain the torch at a constant distance from the pipe.

•

Bleeder Valve: Hydrovalve Co. (Brooklyn, N.Y.) has expanded its line of low-cost bleeder valves for refrigeration systems, oil-burner fuel units, hydraulic cylinders and pumps. New sizes available: ¼, ⅛ and $\frac{1}{16}$ in. A regular hex wrench fits the brass valve's needle-type socket screw.

•

Pressure Gauge: A pressure gauge for high-temperature applications that require a short, compact sensing element is a new offering of Helicoid Gage Division of American Chain & Cable Co. (Bridgeport, Conn.). Pressures are indicated on the dial by displacement of a liquid in the Bourdon tube—a glycerine-water solution is used for temperatures to 200 F, silicone oil for temperatures between 200 and 500 F. At high temperatures, maximum pressure rating is 1,000 psi.; at normal temperatures the rating is 2,000 psi. Accuracy is within 1% of full scale.

Moisture Monitor: For continuous, accurate measurement, remote recording and control of low-moisture levels, Consolidated Electrodynamics Corp. (Pasadena, Calif.) recommends its new Type 26-310 process moisture monitor. Accurate measurements of less than 1 ppm. water are possible. Key: the electrolytic cell in which absorption and electrolysis take place simultaneously. The control unit may be placed up to 500 ft. distant. The instrument operates on 105-125-v., 50/60-cycle ac.

•

Adhesive: The Flexrock Co. (Philadelphia) is out with a new adhesive for binding Teflon to Teflon or to metal or other materials. Called Flexrock No. 80, the pressure-sensitive adhesive has a peel strength of over 1,000 gm./sq. in. and a direct pull strength of 12-15 psi. for Teflon to Teflon or Teflon to stainless steel.

The adhesive is said to have good acid- and alkali-resistance, excellent electrical properties. It can be applied by brushing, dipping or spraying. Air-drying time of several hours can be reduced by heating to 210 F for 15-30 minutes. Heating to 300 F for five minutes results in greater adhesive strength.

•

Vacuum Gauge: A new line of electrical vacuum gauges for measurement of low pressures has been introduced by Vacuum Equipment Division of F. J. Stokes Corp. (Philadelphia). Sensitivity is obtained through use of a patented thermopile circuit in which noble-metal elements are butt-welded into continuous wires.

Heated elements reach operating temperature within one-half second after the instrument is turned on. Three indicating and recording models are available: Model TP-5 for 1 to 100 microns pressure; Model TP-3 for 1 to 1,000 microns; Model TP-4 for 1 to 20,000 microns.

•

Instrument-Tubing Clamp: T. J. Cope Division of Rome Cable Corp. (Collegeville, Pa.) is out with a cushion clamp for securing instrument tubing to a tubing support when vibration must be minimized. The clamp consists of two pieces of sponge neoprene. Nitrogen-filled voids prevent moisture absorption. Widths: to 24 in.

•

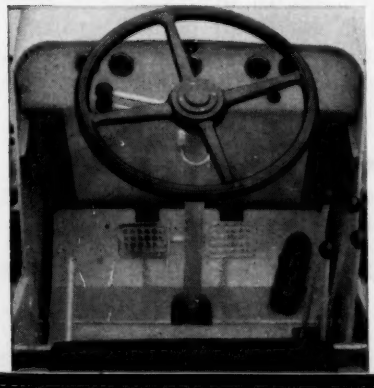
Double-Seal Valves: A new valve-seating arrangement that uses Teflon to achieve a double seal is available in valves of W-K-M Division of ACF Industries, Inc. (Houston, Tex.). The valves are recommended for handling petroleum products at pressures up to 5,000 psi. The first seal occurs when the expanding gate and segment faces of the valve contact the Teflon insert. The second seal is made by the gate and segment faces against the metal seat. The Teflon insert is self-lubricating, provides a slick, smooth surface for the gate and segment to glide across.

If you had to drive a car for 8 solid hours in traffic like this . . .

would you be satisfied with an old fashioned gear shift?

Even an antique car enthusiast will have to admit that a manual gearshift is a tiresome business when you're caught in a traffic jam—when you have the constant clutching, and declutching and inching along in bumper-to-bumper traffic.

Did you ever recognize the similarity between a traffic jam and a typical bulk-handling job? In both cases, the runs are relatively short, constantly Stop and Go (and in bulk handling, constantly Forward and Backward). The automobile manufacturers long ago took this burden off the driver by giving him various types of "clutchless" transmissions. Now Clark has done the same thing for the industrial Tractor Shovel operator: Clark's exclusive Power-Shift transmission on the 16 cu. ft. MICHIGAN Model 12B.



No clutch pedal, no engine clutch

The small photo at left shows the operator's compartment of the MICHIGAN Model 12B. There's a double brake pedal—operate it with either foot. There's no clutch pedal, no engine clutch, no gear clash when shifting. This heavy-duty Clark transmission is as fast and as easy to operate as a modern car—the driver merely selects High-Low-Forward or Reverse and lets the Power-Shift transmission do the work. He can make any shift while moving in either direction.

Improves operator efficiency

Power-shifting drastically reduces operator fatigue. The MICHIGAN operator doesn't have to ride a clutch all day. He can work smoothly and easily through peak periods throughout the day and still be close to top efficiency when bulk-handling runs overtime. New operators can learn to run the MICHIGAN Model 12B in a few hours. And when several operators take turns on the MICHIGAN, the machine doesn't suffer—the hydraulic-operated Power-Shift transmission provides built-in protection against "clutch riders" and "cowboys."

See for yourself

Without any obligation, you can put the MICHIGAN Model 12B to work on any job in your own plant. We'll bet the MICHIGAN will outproduce any loaders in its size range, bar none. You be the judge. Clip the signature below to your letterhead and mail to us—we'll make the arrangements for an on-the-job demonstration.

Michigan is a registered trade-mark of

CLARK EQUIPMENT COMPANY
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2459 Pipestone Rd.
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Your plastic products will really go places when they're pigmented with TITANOX titanium dioxide white pigments. *Nothing* can surpass titanium dioxide for whitening, brightening or opacifying any type of plastic . . . vinyls, polystyrenes, cellulosics.

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*TITANOX is a registered trade mark for the full line of titanium pigments offered by Titanium Pigment Corporation. 5213-A

Market Newsletter

CHEMICAL WEEK
September 14, 1957

This week, Canada snips a couple of lines tying it to U.S. suppliers of chemical products. The items: titanium pigment and Orlon acrylic fiber. The Dominion's first titanium pigment plant (built at Varennes, Que., by a National Lead subsidiary, Canadian Titanium Pigments Ltd.) was officially opened this Wednesday. It will begin full production immediately. Output is aimed at Canada's paint, paper, rubber, plastics, roofing and floor-covering industries.

The installation costs some $15 million; and though the company is mum on capacity figures, trade observers peg the plant's capability at about 25,000 tons/year, approximately 10,000 tons/year less than the unit at St. Louis, Mo., operated by National Lead's U.S. subsidiary, Titanium Pigments Corp.

Canadian-made Orlon acrylic fiber is now in production, for the first time, at Du Pont of Canada's new $8-million plant at Maitland, Ont. Shipments to textile mills will begin shortly after a "normal breaking in" production period.

The new plant, says I. D. Ritchie, manager of the company's textile fibers division, "represents a small but important gain in respect to Canada's serious trade imbalance with the U.S., supplanting reliance on an imported product by domestic manufacture." Ready availability of the fiber, plus technical assistance, is also expected to help the Canadian textile industry meet the competition of imported fabrics and garments.

•

Is the U.S. squandering its helium resources? Yes, says a resolution sent to President Eisenhower by the Fifth International Conference on Low Temperature Physics and Chemistry, held recently at the University of Wisconsin.

"The U.S. is blessed with a limited number of natural gas fields that yield gas containing an appreciable percentage of helium," the resolution states, and "no other known source of importance exists. The helium-bearing gas from these fields is flowing to market at a prodigious rate, and only a small fraction of the gas is being stripped of its helium. The remainder is irrevocably lost."

"There is real danger," it's pointed out, "that our helium supply from this cheap source will be exhausted in a decade or two unless immediate action is taken."

The resolution urges the U.S. government to seek, without delay, a means of recovering and conserving, for this and future generations, the helium now being wasted.

The 400 leading world scientists at the conference were especially worried about the wastage because of the importance of helium to

technology and scientific research for industry, aviation, and high-speed computing. In many of these applications, there is no known substitute for helium.

•

A price reduction on Mylar polyester film now brings the cost of most types of the film down to about $2/lb. The 25¢/lb. reduction by Du Pont—the fourth such price shave since production began three years ago—applies to all coated and heat-shrinkable types, and to Types A and D in all gauges. There's no change in the price of Type C Mylar because of its higher manufacturing cost.

•

Carbon disulfide tabs are up, but not as much as some would like. Stauffer's 10¢/cwt. boost will likely scuttle the considerably heftier 30¢/cwt. increase announced last week by another producer.

New price for disulfide will be $5.55/cwt. in tank-car quantities, delivered. The change will become effective immediately on spot sales, and Oct. 1 on contract orders.

•

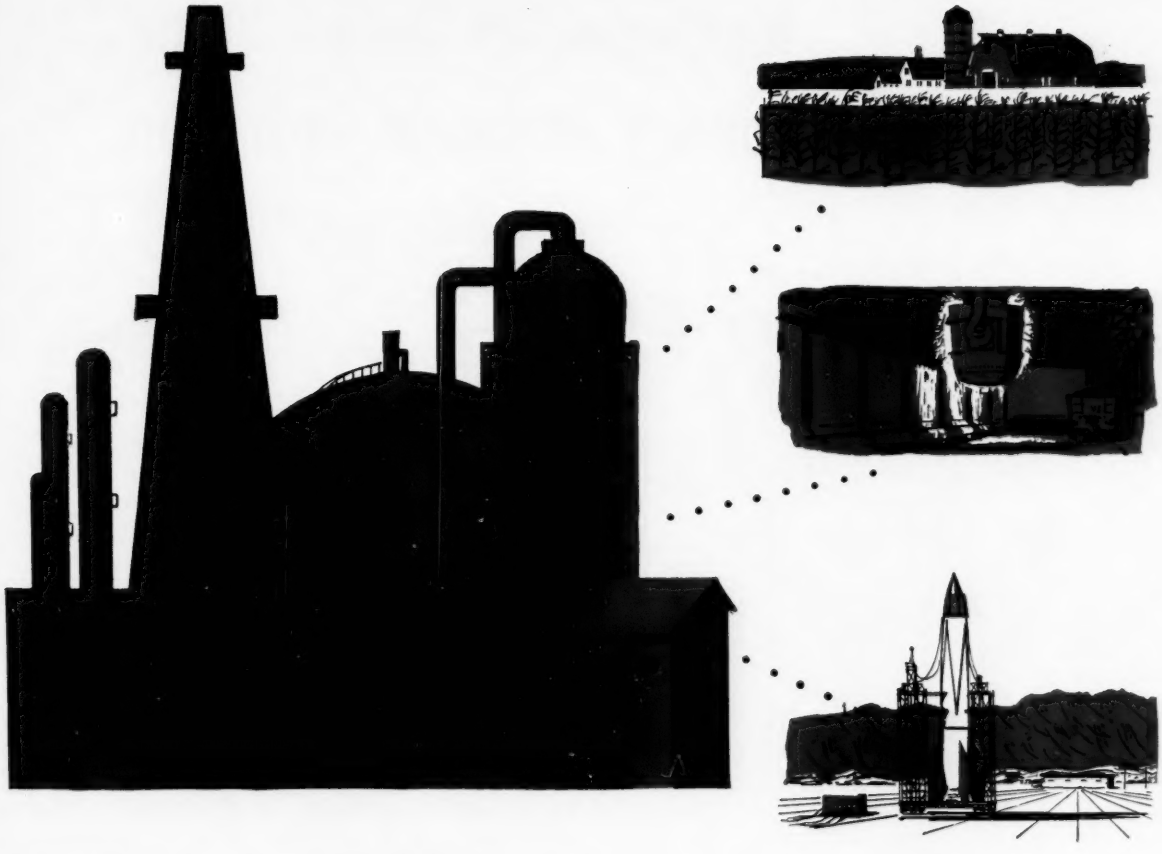
Also higher are fourth-quarter phosphoric acid prices. Producers have advanced contract prices for the acid 25¢/cwt. across the board, boosting, for example, 75% foodgrade material to $5.60/cwt. in tanks (f.o.b., works).

Sodium phosphate producer Monsanto's new price list will also include these changes: anhydrous monosodium phosphate goes up 30¢/cwt. to $9; trisodium phosphate (anhydrous) is increased by 40¢, to $9.05/cwt. The company's technical grade of sodium acid pyrophosphate-x (SAPP-X) will cost 25¢/cwt. more ($10.85). Oilfos, S.Q. phosphate, and sodium hexametaphosphate are increased 30¢/cwt. to $11.10.

SELECTED PRICE CHANGES—Week Ending September 9, 1957

	Change	New Price
UP		
Sodium hydrosulfite, l.c.l., l.t.c., dms., frt. alld.	$0.0025	$0.2475
Sulfur, refined grades, flower, NF, bgs., mines, cwt.	0.50	5.25
DOWN		
Carnauba wax, North country, No. 3, Ceara, crude, bgs., ton lots	$0.02	$0.70
Copper oxide, black, bbls., 100-1,999-lb. lots, wks.	0.01	0.4525
Copper sulfate, cryst., 99%, bgs., c.l., cwt.	0.40	11.55
Platinum metal, wks., oz.	2.00	82.00
Tung oil, domestic, dms., mills	0.0025	0.2275

All prices per pound unless quantity is stated.



Atlantic makes Anhydrous Ammonia for every use

Anhydrous ammonia is a versatile chemical raw material. It is used in the manufacture of fertilizers, stainless steels, plastics and rocket fuels—to name only a few of its industrial applications.

Whatever use *you* have for it, Atlantic is ready to supply it promptly . . . *and* to provide expert technical assistance in its applications.

Anhydrous ammonia is only one of the Atlantic family of petrochemicals. Both industry and agriculture are constantly finding new and profitable uses for Atlantic petrochemicals, which are characterized by uniform quality and stable supply.

For more information on anhydrous ammonia and other Atlantic petrochemicals, write or wire The Atlantic Refining Company, Dept. H-12, at the nearest office listed.

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PETROLEUM
CHEMICALS

Philadelphia, Providence, Charlotte, Chicago

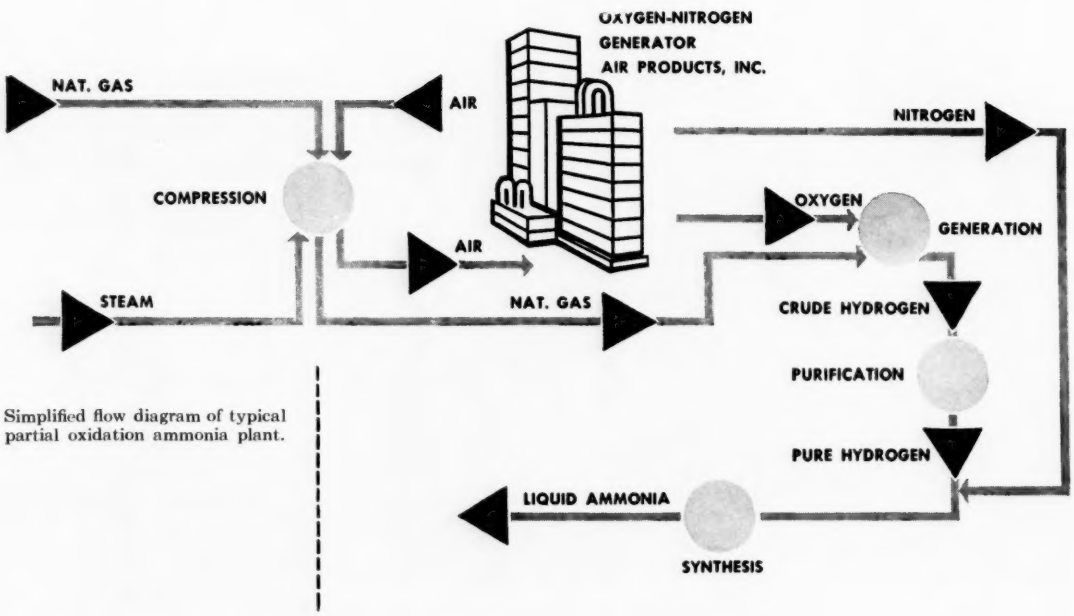
In the West: L. H. Butcher Co.

In Canada: Naugatuck Chemicals Division of Dominion Rubber Co., Ltd.

In Europe: Atlantic Chemicals SAB, Antwerp, Belgium

In South America: Atlantic Refining Company of Brazil, Rio de Janeiro

Maximum "On-Stream" Time Lowers Ammonia Cost/Ton



Simplified flow diagram of typical partial oxidation ammonia plant.

... using Air Products Oxygen-Nitrogen Plant and Nitrogen Wash Process

Thanks to an increase in the amount of time that ammonia plants can spend "on stream", the dollar cost per ton is down. The increase is due to the dependability of Air Products low temperature air distillation, liquid oxygen pumping and nitrogen wash systems. Greater dependability means less down-time and increased production without increase in cost. One ammonia plant's oxygen-nitrogen generator, for example, set a record of 14 consecutive months without shutdown ... permitting continuous production of ammonia for the entire period.

Air Products are specialists in processing low molecular weight materials at cryogenic temperatures. Our research and engineering activities, for ourselves as well as others, have developed a wealth of unique data, processes and equipment that may well point the way to profitable opportunities for you.

If your needs are to separate, purify, or liquefy gases ... tell us your quantity, purity and pressure requirements ... and let us suggest how this can most profitably be done at the low end of the temperature scale. Air Products, Incorporated, P.O. Box 538, Allentown, Pa.

Air Products
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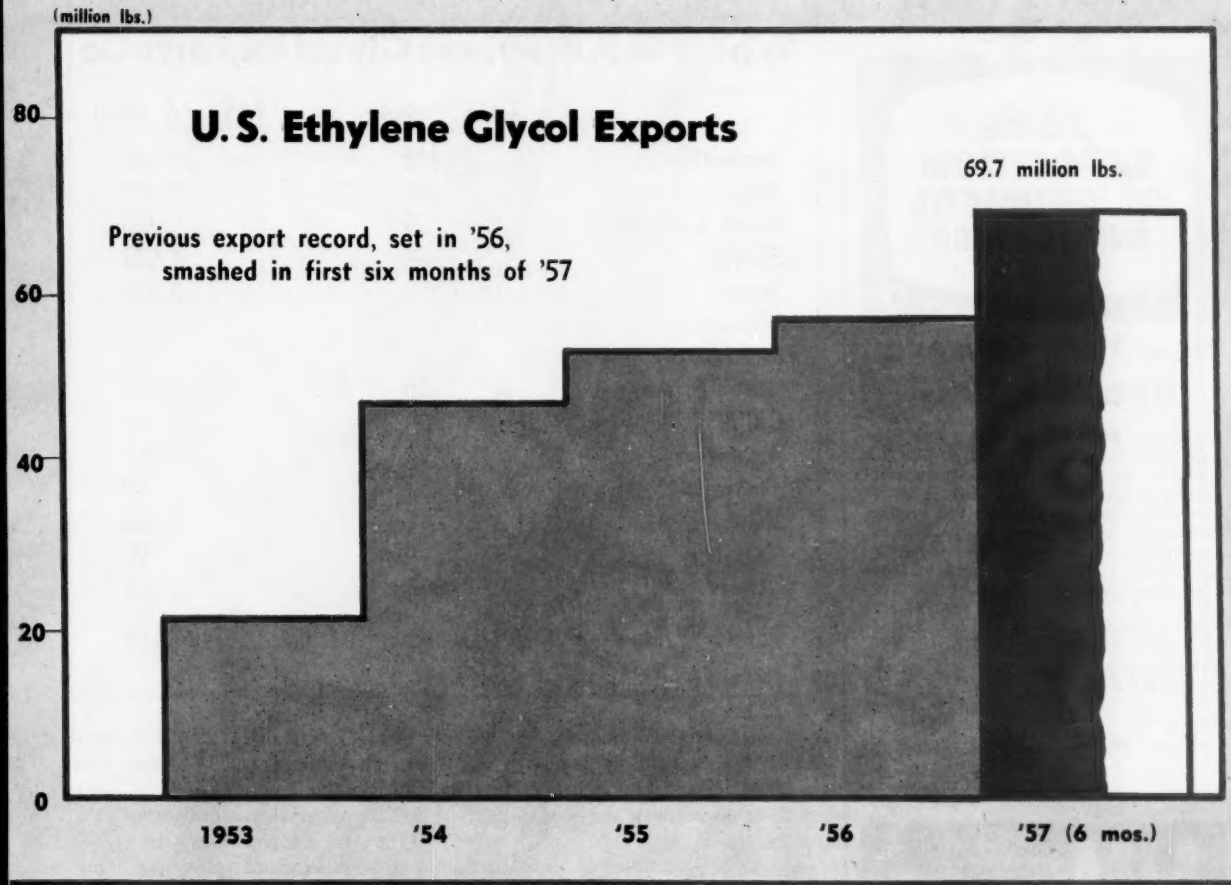

Export Enigma: Who's Buying U.S. Glycol?

U.S. ethylene glycol is pouring into European markets at a record-breaking rate. Exports for the first six months of '57 totaled 69.6 million lbs., some 22% more than for the whole of '56—itself a record year. As a result, startled market observers are asking two pertinent questions: Where is it all going? Will glycol exports during the second half of '57 continue at the same rate, boost the year's total to a staggering 135 million lbs.?

Whether or not this flood of glycol exports will be sustained during the second half of '57 is moot. Some market observers confidently predict there will be no significant letup, that at least 120 million lbs. of glycol will be shipped overseas this year.

However, there's apparently little evidence to back up the prediction—except the unsupported assumption that the over-all '57 export pattern for glycol will parallel that of past years. (Last year, for example, U. S. ethylene glycol exports totaled about 56.8 million lbs.—of which 31 million lbs. were shipped during the second half of the year.)

Major U.S. producer-exporters, on the other hand, are reluctant to forecast the probable total volume of '57 glycol exports; in fact, they discount the idea that the heavy volume racked up during the first six months will be sustained during the rest of the year.

Says a spokesman for Union Carbide, "The second half of '57 won't be as bright as the first half." From Dow: "Indications are that the second half of '57 will see a smaller tonnage purchased, since purchases of antifreeze (by foreign customers) have already been made for the forthcoming winter season." What will happen during the rest of the year "can't be predicted because the volume of glycol demand depends on too many economic factors over there," Dow's spokesman adds.

It's a fairly safe bet, however, that this professed "uncertainty" about future U.S. glycol exports, at least in part, reflects an unwillingness by producer-exporters to reveal information that could be of value to current—or potential—competitors. Meanwhile, market researchers who independently try to unravel the glycol puzzle are hamstrung by a dearth of information on glycol needs of foreign buyers, the ultimate destinations of U.S. glycol exports, and essential data on the complex cross-shipments of glycol between European countries.

Destination Unknown: What's so mysterious about the destination of U.S. ethylene glycol exports? The U.S.

Tune in on
What's New
at the

26th EXPOSITION OF CHEMICAL INDUSTRIES

New York Coliseum, Dec. 2-6, 1957

Make your plans *now* to attend with your associates. Plan on seeing over 500 exhibits of new developments . . . new cost-cutting improvements . . . new products and techniques that can help you in your own operations. Process equipment, instrumentation, packaging and handling, plus special sections on chemicals and raw materials, laboratory equipment and supplies.
Reserve the time and place *now* on your calendar.
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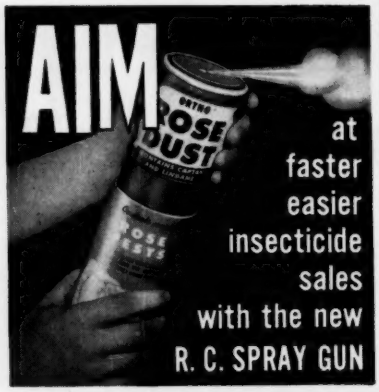

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Where U.S. Ethylene Glycol Exports Go

(thousand pounds)

	1956 Total	1957 (6 mo.)
Netherlands	24,443	33,445
Belgium	13,396	20,647
West Germany	14,209	5,900
France	—	4,629
Japan	2,598	3,934
Mexico	376	461
Sweden	89	110
Union S. Africa	25	104
Chile	238	90
Argentina	91	81
Australia	52	73
Spain	284	66
Italy	—	59
Others	1,002	124
Totals	56,803	69,723

Dept. of Commerce monthly issues a country-by-country breakdown of U.S. glycol shipments (*see chart above*), but these government statistics do not tell the whole story.

A major portion of exported ethylene glycol goes to Belgium and the Netherlands—and the Dutch get the larger share. For example, of the total 69.6 million lbs. of glycol shipped overseas during the first six months of '57, nearly 33.5 million lbs. went to the Netherlands, 20.6 million to Belgium. Taken together, that's a 77% slice of the total U.S. glycol export volume so far this year. (Some 5.9 million lbs. went to West Germany, nearly 4 million to Japan; France, for the first time, took a sizable 4.6 million lbs. The remaining near-1.2 million lbs. were shared by a dozen or more other countries.)

But a lot of the U.S. glycol going to the Netherlands is for transshipment.

Compare U.S. export data with Netherlands import statistics (1956 figures are used because of the meager '57 Netherlands data) to see why the interest of trade followers has been piqued. Last year, the U.S. exported 24.4 million lbs. of ethylene glycol to the Netherlands, yet Netherlands import statistics reveal that only about 1.2 million lbs. of the material entered the nation's economy. This indicates that the remaining 23.2 million lbs. of glycol—representing 95% of the total sent to Holland last year—were sent to Dutch ports for transshipment to other nations.*

Where is it transshipped? The answer doesn't emerge easily. The U.S. government doesn't report the final destinations; and because Netherlands import statistics take no cognizance of its entry into Holland, the glycol obviously can't—and doesn't—appear in Dutch export data.

Behind the Curtain? U.S. trade circles are rife with reports that much of the ethylene glycol going to the Netherlands is transshipped to points behind the Iron Curtain. Admittedly, there's no direct proof that this is actually the case.

Dow Chemical is generally acknowl-

*Aside from glycol that's transshipped, the Netherlands exports relatively small amounts of the material to other European nations. In 1956, a total of 332,000 lbs. was exported to these countries: Belgium-Luxemburg, 52,800 lbs.; West Germany, 233,200; Sweden, 26,400; Austria, 13,200; other countries, 6,600 lbs. (In Jan.-May '57: Belgium-Luxemburg received 11,000 lbs.; West Germany, 160,000 lbs.; other countries, 15,400 lbs.)

Netherlands imports (1956) of ethylene glycol, not including material for transshipment originated from the following countries: U. S., 1.19 million lbs.; Belgium-Luxemburg, 2.06 million; France, 242,000; West Germany, 1.16 million; Italy, 22,000. Total '56 imports: almost 4.68 million. (Imports Jan.-May '57: Belgium-Luxemburg, 602,800 lbs.; West Germany, 1.04 million lbs.; U. S., 640,000 lbs.)

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edged to be the major exporter of ethylene glycol to the Netherlands—a reasonable assumption because the firm has a wholly owned subsidiary in Holland (Nederlandsche Dow Maatschappij N.V.); the firm, according to Dow's 1957 annual report, has "continued its profitable operation and is a great aid in marketing [Dow's] products in Europe."

Dow spokesmen deny, of course, that any glycol is going to the satellite countries, say "the material is sold out of Rotterdam to industrial and antifreeze users in West Europe, with the understanding that these users consume the tonnage purchased." However, Dow won't divulge the ultimate destinations of their glycol "because of business ethics." Understandably, the firm could view the "behind the Curtain" allegation as a baited trap, trying to lure it to voluntarily tip off potential competitors to its lush European markets by offering "proof" that the glycol stays in Western Europe.

(Incidentally, Dow spokesmen relate the current upsurge in glycol demand to "the economic results of the Suez crisis," imply that European glycol producers have been seriously hampered by the petroleum shortage created by blockage of the Suez Canal. Hence, U.S. glycol is needed to fill the shortage until normal European production of glycol can catch up with the demand.)

Supporting the contention that U.S. glycol does not go behind the Curtain is a U. S. Dept. of Commerce statement to the effect that no licenses have been issued in the past three years—and none are now in effect for the sale of ethylene glycol to subgroup A countries, i. e., Russia and its satellites (not including Yugoslavia).

And *CW's* Amsterdam correspondent reports that official and private sources in Holland "strongly deny that, as far as Dutch transactions are concerned, any part of the ethylene glycol has been finding its way to any country behind the Iron Curtain." It's emphasized that Dutch authorities exercise exceedingly sharp control in this respect.

Although the Dutch sources were unable to reveal the actual volume of glycol transshipments, they declare that products shipped to Rotterdam, and not used domestically, are re-exported mainly to France, West Germany and Belgium. (Unfortunately, the import statistics of France and West Germany are so inadequate that they cannot be used to verify the Dutch reports.) The ultimate users in these countries are, reportedly, large chemical firms that are unable to produce enough ethylene glycol for their needs.

How long will the current unproclaimed boom in foreign glycol sales last? Is it a temporary market or one with lasting potential? How high will U. S. glycol exports climb this year and in the years ahead?

It may be some time before chemical marketers can pick up enough reliable information to answer these provocative questions and forecast accurately the future of the foreign glycol markets. But one thing is certain: U.S. glycol exports are growing too large too rapidly for market researchers to be satisfied with half answers.

TiO_2 Battle in Mexico?

A hot sales battle for Mexico's titanium dioxide market is shaping up between Du Pont and a Mexican firm, Industrias Quimicas Basicas, S. A. Which contender will win depends largely on which gets into production first—but other factors, too, will influence the final outcome.

Key to the imminent fray is the growing volume of Mexico's titanium dioxide imports—4,386 metric tons in '56, an amount worth close to $2.5 million—which currently supply all the material used by Mexico's paint and other industries.

It's customary in Mexico for companies to watch imports in their respective fields, then move quickly when the volume reaches a level that justifies setting up domestic manufacturing facilities. And once a domestic source becomes available, the Mexican government wastes no time restricting imports.

Du Pont's Defense: Du Pont, S. A. de C. V., subsidiary of Du Pont of Delaware, has been supplying Mexican titanium dioxide imports for the past 15 years. Last March, the firm announced plans to build a $2.8-million oxide plant with an initial capacity of 5,000 metric tons/year, with provision for expansion to 7,000 tons/year.

For Du Pont this spelled a good setup because the oxide would be

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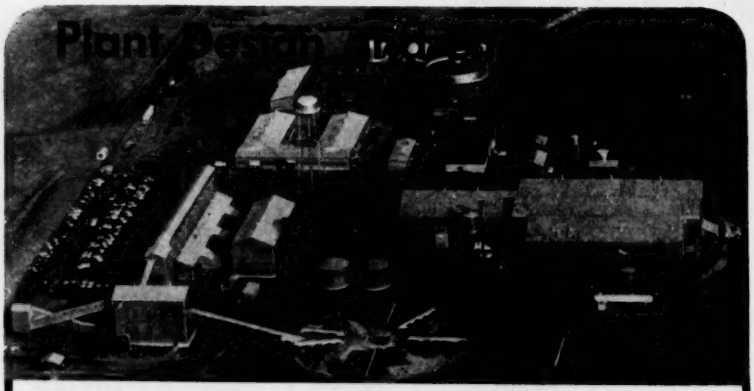

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made in Mexico for the first time, and Du Pont would have the market virtually to itself.

However, the jolt came with the announcement Aug. 29 that Industrias Quimicas plans to build a $6.5-million titanium dioxide plant with an initial capacity of 8,000 metric tons.

Mexican chemical market observers now say there just isn't room for both companies. Much will depend, they say, on which firm gets into production first.

Neither company has yet started construction of a plant—but both will build on as-yet-undisclosed sites in the state of Veracruz.

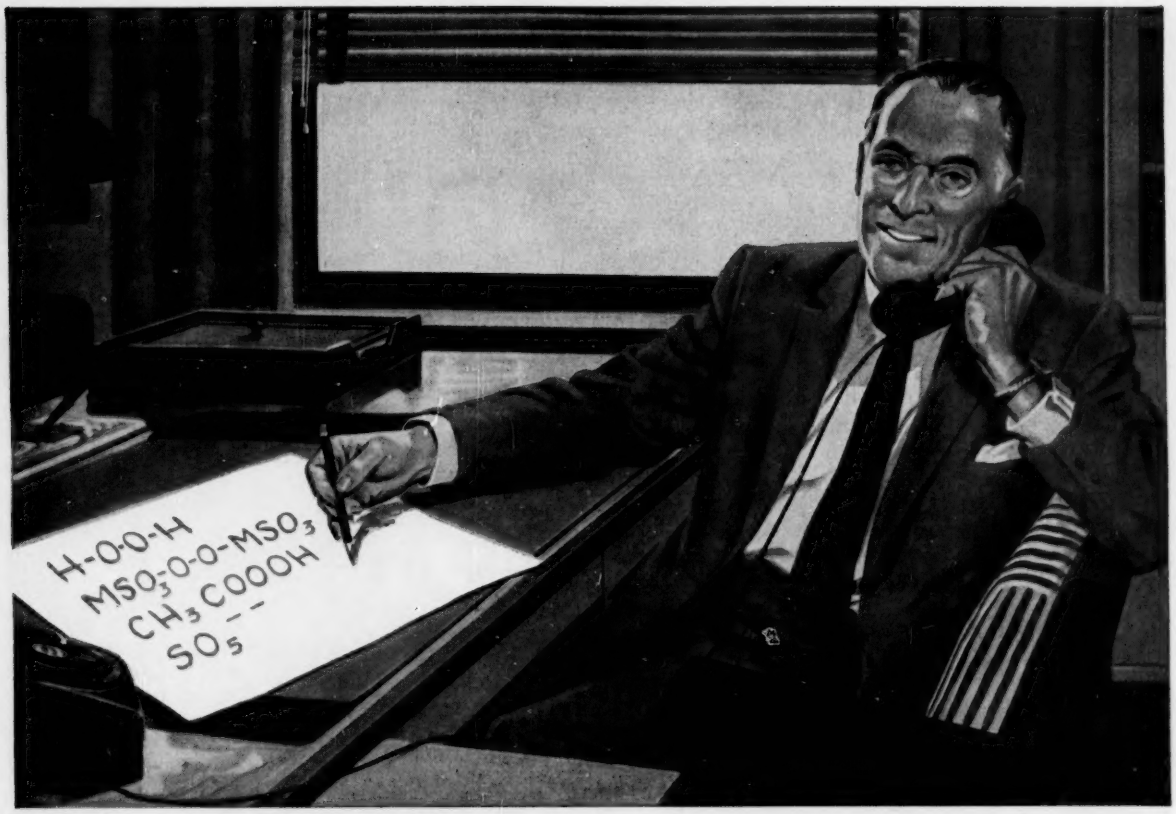
Du Pont declines to say just when its plant will go onstream, says only that orders are to proceed "full speed ahead." Some observers believe that Du Pont has an edge in the race because it has been in the planning stage for a longer time.

Du Pont's long-time status as a titanium dioxide importer is another point in its favor because the firm already has well-established lines of sales and distribution. Furthermore, the Du Pont affiliate is legally a Mexican company and one that has a good reputation in Mexico—another asset in the forthcoming battle against Industrias Quimicas.

Strong Contender: IQB says it hopes to begin production before the end of '58. Several employees of the company are now in training at the Baltimore plant of the Glidden Co. (Cleveland), and it's understood that the Mexican firm has discussed a 10-year know-how contract with Glidden.

Major stockholder in Industrias Quimicas is Emeric Somlo, who reportedly received from $6-8 million last year as a principal shareholder of Syntex, S. A., when the hormone manufacturing firm was sold to Ogden Corp. (New York). Somlo is now in Europe, reportedly trying to arrange financing for the titanium dioxide plant.

Another hot point of discussion among Mexican market observers is the potential influence on the hassle of Nacional Financiera, a detached Mexican government agency that reportedly will have a one-third interest in the Industrias Quimicas plant. The big question: if the Mexican government has capital invested in the proposed IQB plant, would the government permit the venture to fail?



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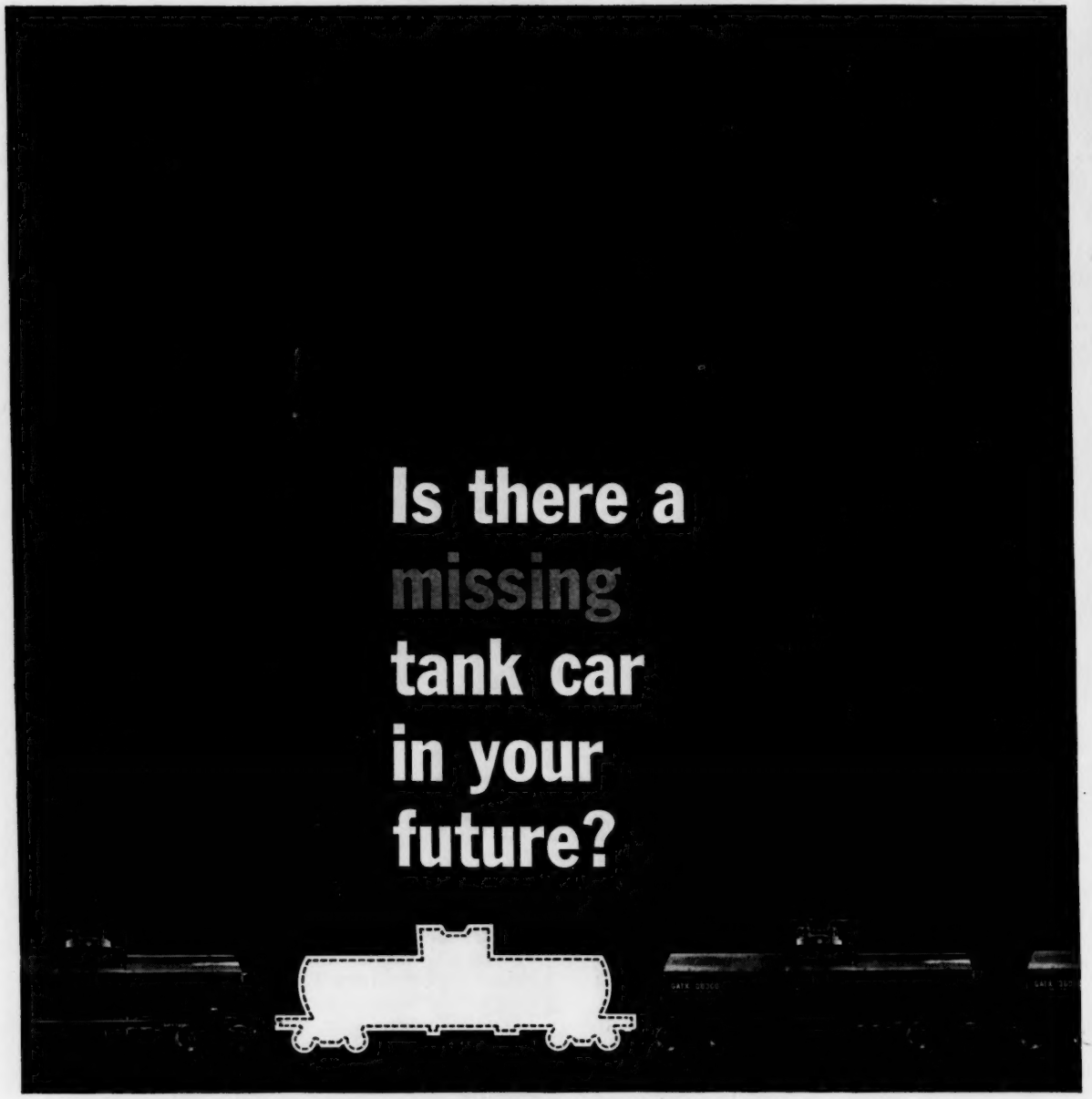

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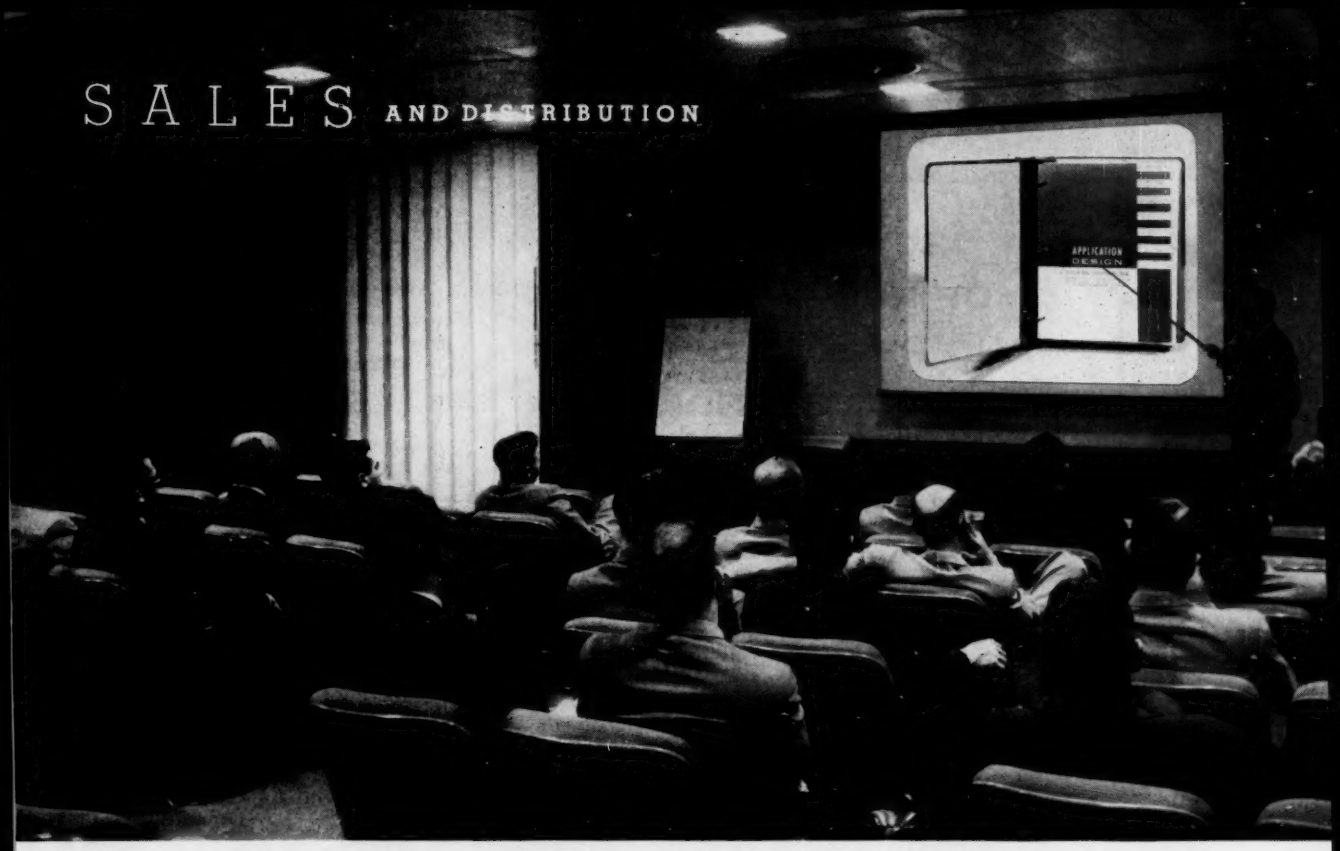

These design engineers aren't likely to forget Du Pont's plastics data handbook after watching . . .

Slide Show: Spark for Brochure Use

How do you get your product literature out of the desk drawer and onto the design board? What makes an engineer reach for your company's booklets rather than those of a competitor's? Answer to those posers is shaping up this week in the plastics industry.

Briefly, it's this: base booklet design on motivation research; promote the literature extensively and on a personal basis to the engineer; restrict circulation of the literature to such an extent that it becomes virtually an honor to obtain a copy.

That's the approach Du Pont's Polychemical Dept. is using for its new handbook of plastic engineering data, "Designing with Du Pont Plastics." Without precedent in the plastics industry, this approach, *CW* finds, is viewed by competitors with a healthy respect and "not for publication" praise. Moreover, it's an approach you may see duplicated in other areas of the chemical process industries—especially where extensive formulation is involved.

Basically, what Du Pont did was this: it prepared a comprehensive manual containing detailed engineering data for polyethylene, nylon, Teflon fluorocarbon resin and its Lucite acrylic resin. The book was then presented to design engineers by a color-slide show and descriptive narration.

Although much technical information on plastics is available, says Bailey Barnes, assistant manager for plastic sales, the data is scattered about in numerous reference sources, is in a variety of units (pounds, grams, etc.). Often, only data on a specific point is available. For these reasons, design engineers are prone to turn to metals for which complete data is available from convenient sources.

But plastic design data—even if handy, does no good for the industry or a company unless the engineer uses it. And that's just why Du Pont probed its own technical staffers on what makes them use or not use a particular piece of literature. From this motivation research, came one guiding principle: convenience.

The finished product contains five separate brochures, which fit into an expandable (to take care of future additions) hard-cover binder. One brochure is devoted to each of the resins and a fifth, "Application Design," covers basic engineering principles, has special chapters on gear, bearing and structural design. Examples, with worked-out calculations, are included in each brochure.

The principle of convenience turns up in a variety of ways:

- Order of contents is essentially identical in each book. Thus, in the books on plastics, a chapter on strength and stiffness is followed by one on creep and cold flow, temperature effect, chemical resistance, etc.
- Extensive use of tables and graphs is made. Curves giving properties over a wide range on environmental conditions are widely used.
- Data (for a specific property) is presented in the same units and form for each plastic.
- The binder and brochure are designed to lay flat when in use.
- Color of booklet matches that of product packaging.

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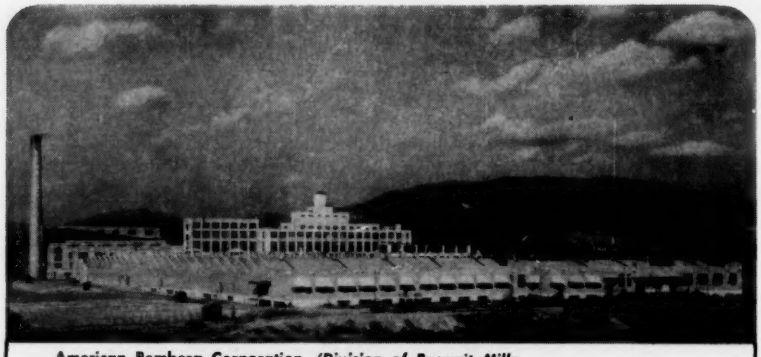

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in the finished project, fix the handbook as a source of engineering data in the minds of design engineers, Du Pont turned to formal presentations. These are replete with color-slide illustrations.

Company salesmen lined up groups of design engineers on the staffs of molders, consulting organizations, companies that can use plastic parts in machinery (projector and electric razor manufacture, for example.

The presentation is usually made by a man from the firm's design-application group. Normally, two technical people and the salesman are present. While the slides are flashed on the screen, the speaker reads a prepared script. It describes the contents of the handbook, shows how the data can be used in solving engineering problems, tells of the completeness and convenience of the publication. Emphasis is on the book, not on the company's products. Naturally, both slide sequence and the talk are varied to fit the audience's interests.

The handbook is usually not distributed at the presentation. Names of those seeking a copy are taken down and a salesman personally delivers the copy on a second visit. That allows the office to control circulation by carefully screening names, gives the salesman another chance to get his foot in the door.

Controlled circulation figures prominently in Du Pont's distribution plans for the handbook. The aim: place copies only in the hands of those* who actually use the data. To achieve that end, no announcement has been made through business publications or even by direct mail. The company has reserved the right to charge nonusers for copies they request. And each book is numbered, thus affording a record of all who receive copies.

Circulation is so limited, says Barnes, that it has become an honor to own a copy. And that's another interest whetter.

So far, Du Pont has made over 500 presentations, distributed about 1,800 copies. Audiences have ranged from a mere handful to upwards of 50 (e.g., in the case of auto companies). The firm is naturally reluctant to disclose the project's costs. But it does estimate, as one cost indication, that

*In a few cases, where customer relations would otherwise be impaired, a few copies have been given to nonusers (e.g., company presidents).

CHEMICALS OUTLOOK

September, 1957

This news bulletin about Wyandotte Chemicals services, products, and their applications, is published to help keep you posted. Perhaps you will want to route these and subsequent facts to interested members of your organization. Additional information and trial quantities of Wyandotte products are available upon request . . . may we serve you?

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Particles of Purecal O are cubical in shape, giving the product superior flow characteristics. In paper coating, this provides a smoother, more uniform paper surface. The average particle size of Purecal O is 0.25 microns, or 0.00001 inches. This particle size has been found to give maximum hiding (covering) power in paper coatings.

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about 35 man-months of an engineer's time went into preparation of the handbook.

Reward: What results the handbook and its promotion will have won't be known for some time. But the effort should benefit the industry, the customer and, of course, Du Pont. Here—believes Du Pont—is how:

- Handbook gives the customer a concise compilation of engineering data. It will stimulate plastic use, facilitate competitive comparison of plastics vs. other materials, encourage correct design of plastic parts.
- Because the properties of competitive plastics are similar, the use of plastics, in general, will be boosted.
- The handbook's dramatic presentation will tend to make engineers think of it when seeking information; conveniently arranged data should encourage calculations based on specifications for Du Pont's materials.

Rough Road: Hopeful as Du Pont is for its venture, it's certain the book will be no "open sesame" to sales. Competitors such as Dow, Monsanto, Olin Mathieson, USI, and Bakelite all recognize the design engineer as an important plastics purchasing influence, are all actively vying for his attention. Bakelite, for example, is currently running a series of advertisements in design publications, stressing new ideas in plastic use. The firm's *Bakelite Review* frequently carries articles beamed at the design engineer. Monsanto's plastics division is now gathering data for reference works on plastics in home construction. And don't be surprised if one or more plastic manufacturers soon begin to publish a periodical devoted exclusively to engineering design. Dow Chemical relies heavily on field courses. Technical specialists from the firm give short but intensive courses to customers' design engineers on the customers' premises.

Other Uses: How applicable is Du Pont's plastics promotion to other chemical materials? A *CW* spot-check of advertising managers uncovers some difference of opinion.

Some see "no reason" why it couldn't be applied to many chemicals if cost was no objection; others think the method is applicable only to plastics and metals, areas that involve some degree of product fabrication. Application might be feasible, too, in areas where end products are form-

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Each Tuesday, 11 days prior to publication date.

• Undisplayed Rate—
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• Box Numbers—
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Our continuing growth as the leader in our respective field requires the immediate acquisition of a B.S. Chemist and/or Chemical Engineer with the following backgrounds:

- ***Petroleum Specialist***
  With two to five years experience in petroleum production or refining.
- ***Polymer Specialist***
  Here we seek a man with two to five years broad experience in either plastics or rubber.

We Offer You—

Dependent upon your training and/or experience the responsibility for our marketing developments to the Petroleum, Plastics and Rubber Industries.

You will be fortified by having the finest research, test, development, and production facilities at your disposal.

The excellent opportunity for advancement and our broad employee benefit program offers an ideal future for you.

Please outline, in reasonable detail, your background, education, experience and salary requirements. We will then try to arrange an early meeting, at your convenience, to discuss your potentialities in our rapidly expanding operation.

Of course, your inquiry will be kept in absolute confidence.

Personnel Manager
Armour Chemical Division
1355 West 31st Street Chicago 9, Illinois
Leader in *Progressive* Fatty Acid Chemistry

Sales Trainee—
Combination direct and technical sales.
Chemistry degree plus 2—3 years plant or laboratory experience required. Send resume in confidence to Personnel Dept..
AIR REDUCTION CHEMICAL CO.,
150 E. 42nd St., New York 17, N. Y.

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c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

Position Vacant

Opening for research and development chemist experienced in the manufacture and various uses of protective coatings, wax, wax compounds, resins, polymer dispersions, plastic, and bituminous materials in industrial manufacturing company laboratory located in Middle West. Apply by letter giving full details of education and experience. All replies will be confidential. P-5213, Chemical Week.

Position Vacant

National Manufacturer looking for experienced salesman for New England territory now selling to companies using emulsifiers, surfactants, wetting agents and defoamers such as rubber, paint, plastic, paper, agricultural and food industries. Must have had recent experience in New England area. Company car furnished with attractive salary and excellent bonus plan. In answering please submit complete resume in first writing. All replies held confidential. Our personnel aware of this ad. P-6101, Chemical Week.

Selling Opportunity Offered

Excellent sales opportunity for technically trained young man to join well-established aggressive firm manufacturing industrial chemicals and specialties in Northern New Jersey. Liberal company benefits. Salary open. Send details resume. RW-6102, Chemical Week.

Selling Opportunities Wanted

Old established highly reputable chemical sales company with main office in New York City is open to represent one more account. Write RA-5732, Chemical Week.

Distributorship—firmly established New York Chemical Sales organization distributing nationally and internationally solicits additional agencies for non-competitive products. RA-6056, Chemical Week.

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has excess facilities and services available

This plant located at Columbia, Mississippi is engaged in producing basic and processed wood naval stores. We have excess facilities and services that can be profitably used for custom processing or in the manufacture of various types of products.

Here is an ideal set-up and location where everything is favorable for comfortable and helpful living.

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Approximately 20 acres under cyclone fence

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INVESTIGATE this unusual manufacturing site

Let us give you the complete details which will prove most interesting to any company contemplating a move or an additional plant.

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BO—6017 Chemical Week
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By a large manufacturing concern. A small operating Chemical Research Laboratory, staffed and equipped. Must have some color and dyestuff experience. Knowledge of Waxes and Oils also desirable.

BO-5680 CHEMICAL WEEK

Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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Sharples C-20 Super-D-Hydrator Centrifugal T-316 Stainless steel contact parts. 20-hp motor, controls. Albert Bramer Assoc's., 818 Olive St., St. Louis 1, Mo.

Business Opportunities

Process available for manufacture of an extremely unique and different wax paper product. Desire to negotiate for its production and sales distribution. BO-5863, Chemical Week.

For sale 80 acres or less. R. R. and Utilities. Any type industry Met. N. Y. Write owner, P. O. Box 26, Carlstadt, N. J.

SALES

ulated. Most, however, would like to see cost-vs.-results figures before they'd consider a similar venture.

Despite such scattered skepticism, however, the method of stirring interest in product literature by means of personal promotion strikes most as worthwhile. At the least, that presages a thorough examination of Du Pont's venture.

DATA DIGEST

• **Ammonia:** Comprehensive 68-page brochure offers data on chemical and physical properties, specifications, handling, storage and end-use. Bibliography is included. Nitrogen Division, Allied Chemical & Dye Corp. (New York).

• **Gas delivery:** Bulk delivery method of shipping industrial gases is discussed from equipment, storage, instrumentation and economic viewpoint. Air Reduction Sales Co. (New York).

• **Chromic acid:** 8-page booklet presents manufacture and quality control factors. Better Finishes & Coatings Inc. (Newark, N.J.).

• **Gases:** Booklet, "Standard for Bulk Oxygen Systems at Consumer Sites," offers guide for installation of liquid or gaseous oxygen systems. Another publication, a new 1957 edition of "Standard for Storage and Handling of Liquefied Petroleum Gases" updates earlier data, now includes facts on container assembly, ICC regulations governing containers permanently mounted to trucks, and precautions to follow in parking gas cargo trucks. National Fire Protection Assn. (Boston).

• **Antioxidants:** Wall chart gives guide for use of isoascorbic acid or sodium isoascorbate in meat preservation. Chas. Pfizer & Co. (Brooklyn).

• **Chlorinated hydrocarbons:** Applications, solubility, flash point, density and other data are offered for perchlorethylene, trichlorethylene, carbon tetrachloride, methylene chloride and chloroform. Stauffer Chemical Co. (New York).

• **Food flavors:** Book, "Chemistry of Natural Food Flavors," discusses research techniques and methods, fruit and vegetable flavors and specific flavors of cheese, bread, beer, poultry and coffee. Quartermaster Food & Container Institute, Dept. of the Army (Chicago).

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CHARTING BUSINESS

September 14, 1957

More Cement—Market for Chemicals

By the end of the year, production of portland cement is expected to hit a high of 325 million bbls.—an impressive 43% surge over 1950's output. Factors that helped spark this sharp rise: greatly expanded building activity; improved techniques in use of cement in forms such as precast; increased diversification in end-use.

This upped demand for cement and concrete is a boon for chemical producers, since chemicals play an important role in the production of these materials. Chemicals such as gypsum, boron compounds and sodium phosphates act as retarders in the setting of cement. Alkyl sulfonates and resin soaps are widely used as air-entrainment agents. Important curing compounds for retarding water evaporation are calcium chloride, terpene resins. Surface-sealing chemicals include sodium silicate and fluoride salts. Among plasticizers that are used to improve tensile strength and to provide better resiliency is polyvinyl acetate.

A recent Battelle Memorial Institute survey estimates a current market for 8 million gal. of chemicals applied to concrete surfaces alone.

"Built for his grandson to walk on!"

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● Penta-protected wood lasts up to 4 times as long as untreated lumber. This kind of protection is a profitable investment for people with maintenance problems ... whether they're running a park department or a light and power company.

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Today, penta treatment is the fastest growing method of preserving wood. And RCI, one of America's fastest growing chemical companies, is a top source for pentachlorophenol. If you're currently engaged in, or are considering, the manufacture of wood preservative solutions, fungicides, bactericides, algicides, or herbicides ... or if you do your own treating of lumber, call Reichhold for pentachlorophenol ... now being produced by RCI's Pacific Northwest Division in Seattle.

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Synthetic Resins • Chemical Colors • Industrial Adhesives • Plasticizers
Phenol • Formaldehyde • Glycerine • Phthalic Anhydride • Maleic Anhydride
Sodium Sulfite • Pentaerythritol • Pentachlorophenol • Sulfuric Acid

REICHHOLD CHEMICALS, INC.,
RCI BUILDING, WHITE PLAINS, N. Y.

Creative Chemistry ... Your Partner in Progress RCI

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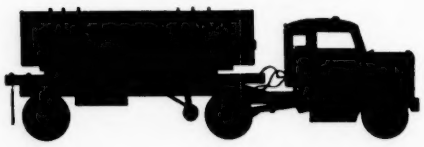

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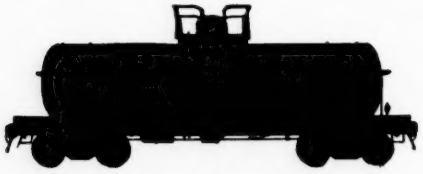

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see GENERAL CHEMICAL

General Chemical's leadership in fluorine chemistry is well established . . . widely recognized. The inorganic fluorine compounds listed here are available now—in commercial or research quantities. Many others are under investigation, or can be produced readily if required. Whenever you need fluorine chemicals of any type—call *General Chemical*, industry's primary source of supply for elemental fluorine, hydrofluoric acid and the fluorine compounds produced from them.

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Fluoboric Acid
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Hydrofluoric Acid, Anhydrous
Hydrofluoric Acid, Anhydrous High Purity
Hydrofluoric Acid, Aqueous
Hydrofluoric Acid, Aqueous, Purified & Reagent
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Sodium Bifluoride

ALKALI FLUOBORATES
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Potassium Fluoborate
Sodium Fluoborate

ALKALI FLUORIDES
Ammoninum Fluoride
Potassium Fluoride, Crystal & Anhydrous
Sodium Fluoride, Technical
Sodium Fluoride, Reagent

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Boron Fluoride Phenol Complex
Boron Fluoride Diacetic Acid Complex
Boron Fluoride Di-n-Butyl Ether Complex
Boron Fluoride Dihydrate
Boron Fluoride Piperidine Complex
Boron Fluoride Ethyl "Cellosolve" Complex
Boron Fluoride Hexamethylene-tetramine Complex
Boron Fluoride Monoethylamine Complex
Boron Fluoride Para-cresol Complex
Boron Fluoride Triethanolamine Complex
Boron Fluoride Urea Complex

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Potassium Ferric Fluoride
Potassium Nickel Fluoride
Potassium Titanium Fluoride
Potassium Zinc Fluoride
Potassium Zirconium Fluoride
Sodium Zirconium Fluoride
Sodium Silico Fluoride
Potassium Aluminum Fluoride

HALOGEN FLUORIDES
Bromine Trifluoride
Bromine Pentafluoride
Chlorine Trifluoride
Iodine Pentafluoride

METAL FLUORIDES
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Aluminum Fluoride, Crystal
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Antimony Pentafluoride
Barium Fluoride
Bismuth Trifluoride
Cadmium Fluoride
Calcium Fluoride
Chromium Fluoride
Cupric Fluoride
Lead Tetrafluoride
Magnesium Fluoride (Not Optical Grade)
Mercuric Fluoride
Manganese Trifluoride
Molybdenum Hexafluoride
Nickelous Fluoride
Selenium Hexafluoride
Silicon Tetrafluoride
Silver Difluoride
Stannous Fluoride
Strontium Fluoride
Titanium Tetrafluoride
Tellurium Hexafluoride
Tungsten Hexafluoride
Zirconium Tetrafluoride

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Boron Fluoride, Gas
Sulfur Hexafluoride

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Silver Fluoborate
Stannous (Tin) Fluoborate
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GC Allied Chemical

Basic Chemicals for American Industry

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.